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## IN THIS ISSUE

WITH increasing numbers of patients being discharged from mental hospitals, it is obviously important to gain more understanding of the relation between the social environment of the discharged patient and his ability to adjust and to remain outside the hospital. The influence of social factors on the relapse or "failure" rates among 155 male patients discharged from mental hospitals in London was investigated by George W. Brown and his findings are reported in the article "Experiences of Discharged Chronic Schizophrenic Patients in Various Types of Living Groups." Two-thirds of these patients remained out of the hospital for at least one year. The data assembled suggest that those who lived with siblings or in lodgings were more likely to succeed in their post-hospital adjustment than the patients who returned to their wives or parents and that this was not due to differences in the clinical condition of the patients but was related more to the nature of the emotional ties and social contacts within these living groups. From this follow-up study of a group of discharged patients, patterns of social adjustment seem to emerge which should be helpful guides to further planned, controlled investigation.

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The great progress in the prolongation of life in the United States in the past half century is known to everyone. Mortality among children and young adults is now at levels thought unattainable in the foreseeable future only a few years ago, and, even at older ages, mortality has been declining steadily. In the article, "Projections of Mortality in the United States to 1970," Professor James D. Tarver, Oklahoma State University, using statistical measures of the rate of decline in

death rates for specific sex-age groups of the white and non-white population from 1930 to 1955, has extended these recent trends to look ahead to the mortality rates and average years of life that may be expected in the near future. Dr. Tarver finds that in 1970 the expectation of life at birth will have reached 70.3 years for white males and 77.8 years for white females, an increase of 3.0 and 4.2 years, respectively, over the lifetime years based on 1955 mortality. For the nonwhite population, greater increases of 5.6 years and 6.9 years are estimated for males and females, giving an expectation of life at birth of 66.8 and 72.8 years for nonwhite males and females, respectively. Predictions are at best uncertain, but in general, previous projections have underestimated the decline in mortality. Progress in the postponement of death from degenerative diseases could make these optimistic estimates conservative, or unexpected events unfavorable to health could temporarily halt the decline in mortality.

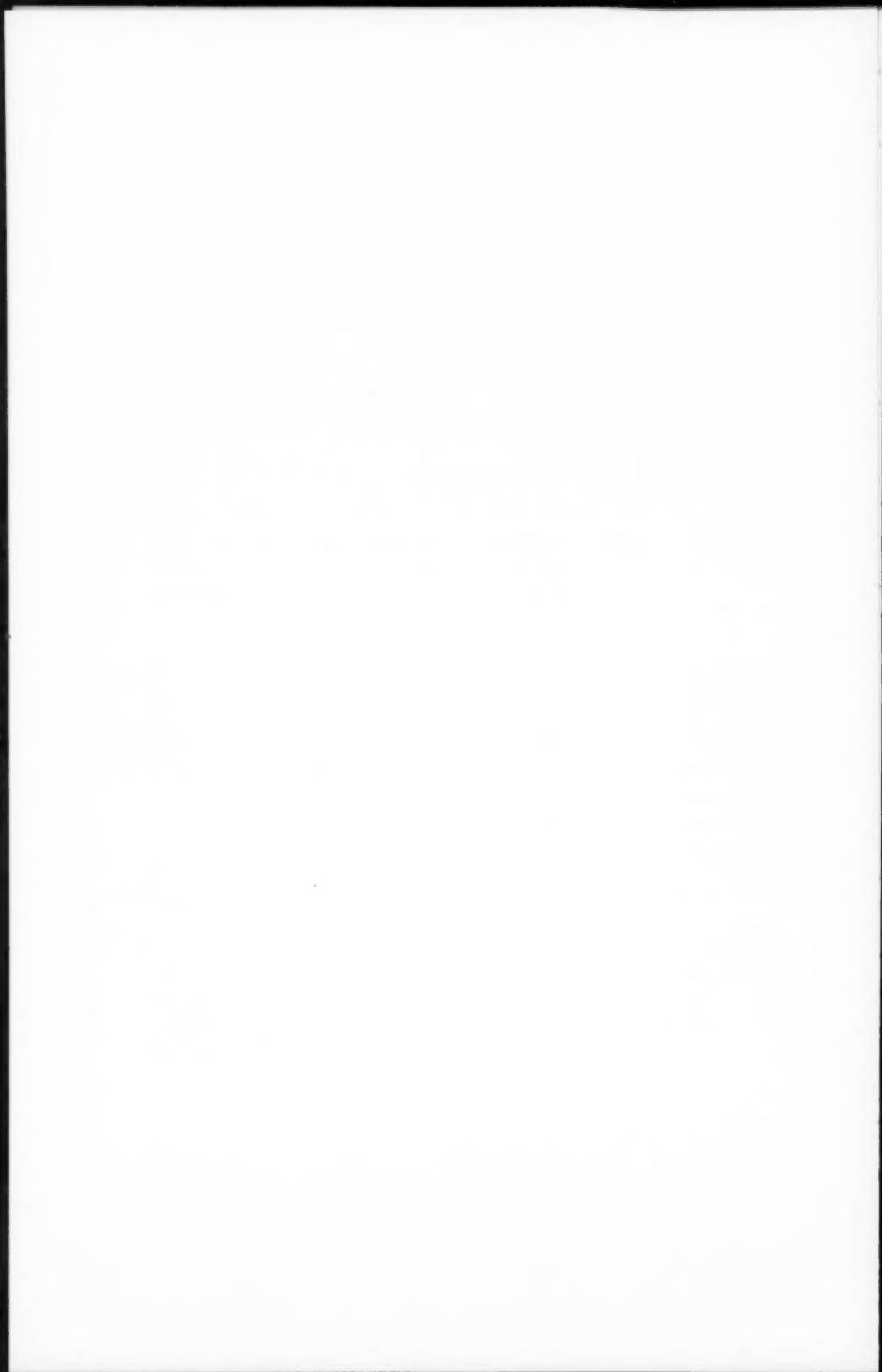
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Research on differentials in mortality by occupational class in this country has been handicapped by the lack of adequate data. Some of the difficulties have been "differences in definitions of occupation on the death certificate and for the census, in reporting practices and in coding." With the 1960 Census in the offing various students have suggested the desirability of planning a study of socio-economic differentials in mortality involving the use of census records for occupational description of decedents as well as that of the population bases for the computation of the rates. The National Office of Vital Statistics and the Bureau of the Census recently conducted a small study designed to test the feasibility of a large-scale study of variations in mortality by socio-economic status. The results are presented by Lillian Guralnick and Charles B. Nam in an article "Census-NOVS Study of Death Certificates Matched to Census Records."

• • •

During the past decade induced abortions have constituted an important means of family limitation in Japan. Con-

cerned over the possible implications of this situation for maternal health and general welfare "the Maternal Health Committee of the Imperial Aid Society for Mother and Child cooperated with the Maternal and Child Health Section of the Welfare Ministry of Japan in a survey of the frequency of induced abortions . . . and the characteristics of women who had them." The data are from questionnaires returned by physicians officially designated to perform abortions in Japan. In a paper in this issue, "Induced abortions in Japan in 1953-1954," Mr. Masabumi Kimura reports on an analysis of the data contained in some 7,000 questionnaires.



# EXPERIENCES OF DISCHARGED CHRONIC SCHIZOPHRENIC PATIENTS IN VARIOUS TYPES OF LIVING GROUP

GEORGE W. BROWN<sup>1</sup>

## I. INTRODUCTION

THIS paper is based on a study of the outcome of 240 male chronic mental hospital patients from seven hospitals, which together provide 15,000 of the 37,000 mental hospital beds in the London area. For the purpose of this inquiry chronic patients were defined as those who were discharged from hospital after a continuous stay of at least two years: readmissions were included. The period of two years was chosen because once a patient has remained continuously in a mental hospital for two years his chances of discharge are relatively small: in England and Wales they range from approximately 1 in 12 in the third year of stay, to 1 in 100 after ten years, and 1 in 200 after thirty years (1, cf. tables M22 and M29). About 80 per cent of the current population of mental hospitals are formed by such chronic patients (1, 2, 3). The major aims of the investigation were (1) to provide systematic data on what happened to such patients once discharged by all methods, including escape, and (2) to make a preliminary evaluation of the influence of social factors on outcome.

Other criteria for inclusion in the series were (1) age on discharge 20-65 years; (2) born in the British Isles; (3) discharged to an address in the Greater London area.

Information about the patient's outcome was obtained through interviews, in their homes, with key persons who had intimate knowledge of the patient during the first year of discharge, and also, if possible, with persons who knew his pre-admission history. Such key persons, typically mothers, wives, sisters, and landladies, and sometimes the patients themselves,

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were located for 229 of the 240 cases (95 per cent), and with the help of data from the case notes, standard interview schedules covering some 160 items were completed; the interview was not formalized but the interviewers used a check list to ensure all items had been covered.

This paper will be concerned with patients who were diagnosed by the hospitals as schizophrenic; interviews were completed for 156<sup>2</sup> of these 164 patients (95 per cent). For the initial analysis "success" was arbitrarily defined as staying out of mental hospital for one year or more, and "failure" as return to hospital within the year. Since information was obtained over a time range from the second year to the seventh year after the key discharge, and note made of any relapse during the period, it was possible, by taking account of the differing periods at risk, to compute that 74 per cent of the schizophrenics who would have relapsed in a six year risk period did so within the first year.

An additional criterion of outcome was obtained by rating the level of social adjustment of all those patients who had not been readmitted to hospital during the year after discharge. This rating was in terms of a four-point scale (to be described in Part III below) based on the patient's employment history, social interaction, and need for supervision. The present analysis will deal with differences of outcome in relation to certain clinical features and more particularly in relation to the types of living group to which patients returned.

## II. SOME CLINICAL CHARACTERISTICS OF THE PATIENTS

1. *Duration of Stay.* Table 1 shows that frequencies for duration of key admission were about equally distributed in the periods 2 years, 3-5 years and over 5 years. Duration of key admission shows no relationship to "failure" rates (total duration of hospital admissions shows similar results). However, patients whose total stay was less than ten years showed signifi-

<sup>2</sup> 155 patients have been included in the following analysis since the "living group" to which one patient returned was not typical (a Mental After Care Association Hostel).

YEARS IN HOSPITAL	TOTAL	NUMBER "FAILURES"	PERCENTAGE "FAILURES"
2	49	14	29
3	27	11	41
4-5	26	7	27
6-9	24	8	33
10-30	29	9	31
TOTAL	155	49	32

Table 1. "Failures" among discharged patients classified by duration of stay in hospital.

cantly lower social adjustment scores than those with over ten years' stay ( $p < .05$ ).<sup>3</sup>

2. *Previous Admissions.* 31 per cent of the schizophrenics were first admissions. Table 2 shows that their "failure" rates were similar to those of the rest of the patients (as also were their social adjustment scores). The small number (27) who had three or more admissions had significantly higher "failure" rates compared with the rest at discharge ( $p < .01$ ).

3. *Age.* Table 3 shows the distributions of age of the patients. The age range was from 20-65 with a mean age of 39.4 years,  $\sigma = 10.4$  years. The means of the "success" and "failure" groups differ by only 1.1 years ( $p > .10$ ), the slight tendency being for older patients to have more "successes." There is a more definite trend for older patients to have higher social adjustment scores but this does not reach significance ( $p > .10$ , 3 d.f.).

Table 2. "Failures" among discharged patients by number of previous admissions.

PREVIOUS ADMISSIONS	TOTAL	NUMBER "FAILURES"	PERCENTAGE "FAILURES"
None	49	15	31
1	40	12	30
2	39	7	18
3 or More	27	15	56
TOTAL	155	49	32

<sup>3</sup>  $\chi^2$  tests have usually been employed: the criterion of statistical significance in this paper will be the .05 level.

AGE AT DISCHARGE	TOTAL	NUMBER "FAILURES"	PERCENTAGE "FAILURES"
20-24	10	4	40
25-29	22	8	36
30-34	27	10	37
35-39	26	6	23
40-44	25	9	36
45-49	19	5	26
50-54	11	5	45
55-59	10	1}	13
60-65	5	1}	
ALL AGES	155	49	32

Table 3. "Failures" by age at discharge.

The above three variables are not independent. When these are considered together, the resulting numbers are small, but no results emerge to contradict these findings.

### III. LIVING GROUPS TO WHICH PATIENTS WENT

A living group was defined as the one in which the patient lived for the major part of his first year of discharge; groups were classified into the following five types. All ratings were made at the time of interview.

1. *Hostels* (13 patients). Patients in this category lived almost exclusively in Working Men's Hostels or Salvation Army Shelters, whose populations usually include a large number of "down and outs." It is possible to live in these hostels, which are usually large, with hardly any personal relationships. Peculiar behavior, such as talking aloud, is common and tends to pass unnoticed. The hostels by present standards are very cheap, enabling a man to sleep there for as little as 18s. per week.

2. *Lodgings* (18 patients). This category implies a commercial transaction with a landlord. In a few cases there was a personal relationship with a landlady, the patient living as "one of the family," but most frequently patients would have little contact with others in the house, typically eating out.



LIVING GROUP	TOTAL	NUMBER "FAILURES"	PERCENTAGE "FAILURES"
Hostel	13	7	54
Marital	14	7	50
Parental	86	31	36
Sibling	24	4	17
Lodgings	18	0	0
TOTAL	155	49	32

Table 4. "Failures" by type of living group in which patient resided after discharge.

3. *Parental* (86 patients). This group includes one or both parents, and sometimes other siblings were present, but the parent was the financial head of the household.

4. *Sibling* (24 patients). 21 patients returned to siblings, usually a sister; 3 patients returned to more distant kin but have been included in this category. In two instances a parent was present, but there was no doubt that it was the siblings' household, the parents being old and infirm and no longer the financial head of the household.

5. *Marital* (14 patients). This included all patients who returned to live with their wives. Several of the wives lived alone. The others lived with their children. In one case the patient's parents were also present.

"*Failure*" Rates. Table 4 gives the number of "failures" occurring in the five types of living group. Percentage of "failures" is high in *hostel*, *parental* and *marital* groups, and low for patients in *sibling* and in *lodgings*, the overall differences being significant ( $p < .01$ , 4 d.f.). The difference between the *parental* and combined *sibling/lodgings* group<sup>4</sup> is large with 36 and 10 per cent of "failures" respectively.

*Social Adjustment Scores.* A scale of social adjustment was applied to all patients who remained out for one year ("suc-

<sup>4</sup> This combination of *sibling* and *lodgings* is used frequently in the following presentation in instances in which there is no significant difference of outcome in these two groups: it enables statistical comparisons to be made with the larger *parental* group. However, later discussion argues that this combination has a more substantial basis than mere expediency.

LIVING GROUP	NUMBER WITH SPECIFIED SCORE					PER CENT WITH SPECIFIED SCORE				
	Total	0	1	2	3	Total	0	1	2	3
Hostel	6	1	1	1	3	101	17	17	17	50
Marital	7	1	2	2	2	101	14	29	29	29
Parental	55	12	15	10	18	100	22	27	18	33
Sibling or Lodgings	38	2	6	14	16	100	5	16	37	42
TOTAL	106	16	24	27	39	100	15	23	25	37

Table 5. Social adjustment scores for "successes" among discharged patients by type of living group.

cesses") scored on their behavior at the end of the year. The scale was arrived at by giving a score of 1 or 0 in three areas of behavior. A point was awarded for full-time work for at least five of the last six months of the first year. Lack of need for supervision, particularly with regard to sleeping habits, toilet, dressing, eating, and spending money, was given a point. Finally those having "satisfactory" interpersonal relationships were given a point—a rating of "unsatisfactory" was only given when there were major discrepancies from the norm, such as violence or threats prompted by paranoid ideas, or extreme withdrawal from social contacts.

Table 5 shows that patients in *parental* groups earn significantly lower social adjustment scores compared with those in *sibling* and *lodgings* groups ( $p < .05$ , 3 d.f.).

It is possible that the less favorable outcome of patients returning to *parental*, *marital* and *hostel* living groups is due to the relatively worse clinical state of these patients at discharge. On the other hand, it may be due, at least in part, to interaction between the patient and his social environment after discharge: if he had returned to a different kind of living group he might have remained out longer and reached a higher level of social adjustment. The following sections will attempt to elucidate the two relationships shown in Tables 4 and 5, keeping these possible alternative explanations in mind: first by comparison *between* types of living group, and then by analysis *within* them.

## IV. COMPARISON BETWEEN LIVING GROUPS

This section reports some of the 150 stratifications carried out on the cross tabulations between type of living group and the outcome criteria (Tables 4 and 5), using third test factors that may be influencing these original relationships. The method (which has been most fully described by Kendall and Lazarsfeld (4), and Hyman (5)) involves examination of the resulting subgroups for evidence of influence of the test factor on the original relationship. Interpretation of results depends on where the test factor is conceived in time in relation to the two original items. Usually those *antecedent* in time are employed to control for likely spurious results; while the general purpose of using test factors *intervening* in time between the two original items is to isolate factors that may help interpret the original results.

The first three test factors used in this section give an indication of the patients' clinical state at discharge and thus help to control the possible effect of a biased distribution of patients of different clinical levels into the several types of living group.

1. *Hospitals' Psychiatric Rating at Discharge.* The mental hospitals assess each patient at discharge as either: "recovered," "relieved," or "not improved." These categories are quite highly related to "failure" rates ( $C = .33$ ,  $p < .001$ , 2 d.f.).<sup>5</sup>

Examination of Table 6 shows that there is only a slight and nonsignificant trend for *parental* to receive patients rated clinically worse than the combined *sibling/lodgings* group ( $p > .10$ , 2 d.f.). *Hostels* receive a relatively larger number of worse cases but the categories of patients going to *marital* and *sibling/lodgings* groups are exactly comparable.

If only those patients in the "relieved" category are considered, the difference in percentage of "failures" between *parental* and the *sibling/lodgings* group clearly remains ( $p < .05$ , 1 d.f.): the differences are in the same direction for patients in the "recovered" and "not improved" categories but numbers are

<sup>5</sup> Uncorrected coefficients of contingency derived from  $\chi^2$  results are used. The maximum size for a  $2 \times 2$  relationship is .707 and  $3 \times 3$  is .816.

LIVING GROUP	TOTAL	DISCHARGE CATEGORY			TOTAL	DISCHARGE CATEGORY		
		Recovered	Relieved	Not Improved		Recovered	Relieved	Not Improved
		NUMBER OF PATIENTS				PER CENT OF TOTAL		
Hostel	13	0	7	6	100	0	54	46
Marital	14	3	9	2	100	21	64	14
Parental	86	10	57	19	100	12	66	22
Sibling or Lodgings	42	9	27	6	100	21	64	14
TOTAL	155	22	100	33	100	14	65	21
		NUMBER OF "FAILURES"				PERCENTAGE "FAILURES" IN DISCHARGE CATEGORY		
Hostel	7	0	3	4	54	—	43	67
Marital	7	0	5	2	50	0	56	100
Parental	31	2	17	12	36	20	30	63
Sibling or Lodgings	4	0	2	2	10	0	7	33
TOTAL	49	2	27	20	32	9	27	61

Table 6. Hospital discharge category for patients in different living groups and "failures" by discharge category and living group.

too small for firm conclusions. "Failure" rates in the *marital* group also remain high. Differences in psychiatric state at discharge in so far as they are reflected in the hospitals' ratings evidently do not account for the results shown in Table 4.

2. *Method of Discharge.* This item has been rated from in-

Table 7. "Failures" by method of discharge for each type of living group.

LIVING GROUP	ON ADVICE			AGAINST ADVICE		
	Total	Number "Failures"	Percentage "Failures"	Total	Number "Failures"	Percentage "Failures"
Hostel	6	2	33	6	4	67
Marital	10	3	30	4	4	100
Parental	58	16	28	28	15	54
Sibling/Lodgings	32	2	6	9	1	11
TOTAL <sup>1</sup>	106	23	22	47	24	51

<sup>1</sup> Two patients, both "failures," could not be rated by method of discharge. One was in the hostel group and one in the sibling group.

formation given in the hospital case notes; when there was doubt, information on this point was sought at the interview itself. 47 patients (including the 15 who escaped) left hospital "against advice." The categories "on" and "against advice" are related to "failure" rates ( $C = .29, p < .01, 1 \text{ d.f.}$ ).

Table 7 shows that differences between *parental* and *sibling/lodgings* groups in percentage of "failures" remain in both discharge categories, being significant in the larger "on advice" category ( $p < .01, 1 \text{ d.f.}$ ), but just below significance in the smaller "against advice" category ( $p = .057$ ). The percentage of "failures" in the *marital* group also remains high in both categories. This suggests that differences in method of discharge do not explain the results shown in Table 4.

Another stratification showed that the *parental* and *sibling/lodgings* groups have approximately the same proportions of patients in the "relieved" category who were discharged "against advice" and "on advice"; and that the different percentages of "failures" persist in both these categories within the "relieved" group.

3. *Leaves in Last Year.* 66 per cent of patients had leave in their last year in hospital but the relationship with "failure" rates is not significant ( $p > .10, 1 \text{ d.f.}$ ). 78 per cent of those going to kin groups had leave, the relative frequencies in the three types of kin group being almost identical.

The different percentages of "failures" of the *parental* and *sibling/lodgings* groups persist in both "leave" and "no leave" categories—the difference in the former is significant ( $p < .01, 1 \text{ d.f.}$ ) and in the latter just fails to reach significance. A high percentage of "failures" also remains in the *marital* group.

Of the patients who had leave, only 1 out of 24 who went to live with *siblings*, as compared with 28 out of 76 who went to stay with their parents, relapsed within a year.

These three results suggest that, although there was some selection of clinically worse patients into *parental* compared with the *sibling/lodgings* groups, the different percentage of "failures" could not be explained by this. Although numbers

	HOSTEL	MARITAL	PARENTAL	SIBLING	LODGINGS
Mean	39.2	40.6	33.7	43.9	49.4
Standard Deviation	7.4	6.4	7.6	8.9	8.4
Range	25-54	30-65	20-49	20-65	30-65

Table 8. Mean age of patients by type of living group.

are small, a similar conclusion would seem to apply to the high "failure" rate of the *marital* group.

4. *Age*. Though there is no obvious relationship between age and "failure" rates (cf. Table 4), there are differences in age distribution of patients in the various types of living group.

Table 8 shows that patients who go to live with their parents have, as one would expect, a younger mean age than the rest. This could introduce some form of bias, but the evidence summarized below argues against this, though it cannot be ruled out.

a. Table 9 shows that patients' age at discharge is not related to the hospitals' discharge categories of "recovered," "relieved," and "not improved."

b. Within the various types of living group percentage of "failures" is not related to patients' ages.

c. Patients returning to *marital* and *lodgings* groups are of similar mean age and contain similar proportions of the three discharge categories but have markedly different percentages of "failures."

d. Matching between living groups is hampered by the small

Table 9. Hospital discharge category by age of patient at discharge.

AGE GROUP	TOTAL	NUMBER IN DISCHARGE CATEGORY			TOTAL	PER CENT IN DISCHARGE CATEGORY		
		Recovered	Relieved	Not Improved		Recovered	Relieved	Not Improved
20-29	32	4	22	6	100	12	70	18
30-39	53	8	33	12	100	15	62	23
40-49	44	3	32	9	100	7	73	20
50-65	26	7	13	6	100	27	50	23
TOTAL	155	22	100	33	100	14	65	21

overlap in patients' age ranges in *parental* and other groups. Considering only patients in the "relieved" category in the age range 35-54, where there is clear overlap, the different percentages of "failures" remain between *parental*/*marital* and *sibling*/*lodgings* groups ( $p < .05$ ). However, this comparison involves only 51 per cent of the "relieved" patients in these living groups.

Similar analysis was carried out with the following six items, none of which was found to invalidate the association of outcome with living group: 5. Duration of key admission and all admissions. 6. Previous admissions. 7. Years since onset of illness. 8. Whether violent or not before admission. 9. Rating of last job before admission. 10. Highest level of social responsibility reached.

It is henceforward assumed that the differential "failure" rates in the various types of living group are not entirely explained by clinical bias. We are now interested in test factors that help us to interpret these differences.

11. *Ratings of Behavior at the End of the First Year of Discharge or at Readmission.* In the course of the interviews informants were asked questions about ten specific aspects of the patients' behavior in the first year, and any other abnormalities of behavior were noted. The ten aspects were: outbursts of temper, violence, expression of strange ideas, talking aloud to himself, unusual or absent emotional response, abnormal sexual behavior, ability to look after personal toilet and money, and three items concerned with the amount of social contact. An index of disturbance of behavior was obtained from the number of positive items. It should be remembered that the data were collected in the second to seventh year after discharge and referred to behavior at the end of the first year or before any re-admission in this period.

A further threefold rating of behavior made by the interviewer was designed to do justice to extreme disturbance in only a few of the items or minimal disturbance in a number of them. Patients who showed only minor peculiarities were rated as "nearly normal": for example, a patient showing queer man-

nerisms and slightly developed delusions. Patients with evident peculiarities which did not or presumably would not have prevented the patient moving around in society were rated as "moderately disturbed": for example, a patient with hallucinations, paranoid ideas, bad temper, and a tendency to act on delusions, such as frequent quitting of jobs in response to them. Patients showing more severe peculiarities, such as could be quoted in ordering certification, were rated "severely disturbed": for example, a patient who was regressed, rarely spoke coherently, mumbled and sang and walked with a peculiar gait, was often deliberately incontinent, shouted out at night, and showed many schizophrenic mannerisms. The interviewers checked each other's ratings regularly in order to achieve rating reliability. The rating of any difficult case was discussed; disagreements were infrequent, and were resolved by accepting the majority opinion.

The relationship of this threefold rating of behavior to "failure" rates is high ( $C = .47$ ,  $p < .001$ , 2 d.f.). It has to be remembered, however, that these ratings were retrospective and that they may have been influenced by the interviewer's knowledge of the patient's outcome.

Table 10 shows that there are more "severely disturbed" and "moderately disturbed" patients in *hostel*, *marital* and *parental* than in the combined *sibling/lodgings* group (for *parental* and *sibling/lodgings*  $p < .05$ , 1 d.f.). There is a significantly higher proportion of "severely disturbed" patients in *parental* (32 per cent) as compared with *sibling/lodgings* groups (9 per cent). If only those patients who were recorded as "relieved" at discharge are considered, there is still a significant trend for more patients to be rated as "moderately" or "severely disturbed" in *parental* and *marital* than in the combined *sibling/lodgings* group ( $p < .02$ , 2 d.f.). The following observations suggest that the more disturbed behavior shown by patients going to *parental* and *marital* groups can be partly attributed to deterioration in behavior during the year after discharge:

- a. Such deterioration in behavior was explicitly reported



LIVING GROUP	TOTAL	RATING			TOTAL	RATING		
		Nearly Normal	Moderately Disturbed	Severely Disturbed		Nearly Normal	Moderately Disturbed	Severely Disturbed
		NUMBER OF PATIENTS				PER CENT OF TOTAL		
Hostel	13	5	6	2	100	38	46	15
Marital	14	2	4	8	100	14	29	57
Parental	86	30	29	27	100	35	34	31
Sibling or Lodgings	42	23	15	4	100	55	36	10
TOTAL	155	60	54	41	100	39	35	26
		NUMBER OF "FAILURES"				PERCENTAGE "FAILURES" IN RATING CATEGORY		
Hostel	7	0	5	2	54	0	83	100
Marital	7	0	2	5	50	0	50	63
Parental	31	1	10	20	36	3	34	74
Sibling or Lodgings	4	1	1	2	10	4	7	50
TOTAL	49	2	18	29	32	3	33	71

Table 10. Rating of psychiatric disturbance in first year after discharge for patients in different living groups and "failures" by rating and living group.

more often in *parental* than in all other groups. ( $p < .05$ , 1 d.f.), although these particular retrospective reports must be very cautiously interpreted.

b. Outbursts of temper in the year after discharge, reported for 53 per cent of patients, and violence, reported for 24 per cent, were significantly related to higher percentages of "failures." These disturbances occurred more frequently in *parental* and *marital* than in the combined *sibling/lodgings* group. Table 11 shows that, even for the patients discharged "relieved," violence was more frequent in the combined *parental* and *marital* groups than in the *sibling/lodgings* group—the difference is significant ( $p < .05$ , 1 d.f.).

c. "Pathological emotional response," "strange ideas," and "talking aloud," occurring in 51 per cent, 52 per cent and 36 per cent of the patients respectively, were also significantly related to higher "failure" rates. But for patients classified as "relieved" these traits did not occur significantly more frequently in *marital/parental* than *sibling/lodgings* groups: indeed, the re-

corded incidence of delusions was 43 and 42 per cent respectively in these combined groups.

This evidence suggests that, although equal numbers of patients in all living groups show some continuing psychiatric symptoms, grossly anti-social behavior tends to be shown more often by patients who are living with their parents or their wives.

Table 10 shows that even within the "moderately disturbed" category "failure" rates are higher for *parental* than the *sibling/lodgings* groups ( $p = .039$ ). Similar trends were obtained when patients were subdivided in respect of the quantitative "index of disturbance" and also by the measures of violence, outbursts of temper, pathological emotional response, strange ideas, and talking aloud to self. The results suggest that the differences in "failure" rates may be partly related to social factors such as differences in level of tolerance and in the amount of social contact made by patients within the living groups.

In case the "moderately disturbed" category might cover a large range, all cases in it were checked by an independent rater using a four point scale. This rater was given complete accounts of a patient's behavior, but no information about social background or "success" or "failure." The distribution of rating scores was almost identical in *parental*, *marital* and the combined *sibling/lodgings* living groups, suggesting that in our

Table 11. Reported violence in living groups for patients classified by hospital discharge category.

LIVING GROUP	ALL PATIENTS			RECOVERED			RELIEVED			NOT IMPROVED		
	Total	Violent		Total	Violent		Total	Violent		Total	Violent	
		No.	Per Cent		No.	Per Cent		No.	Per Cent		No.	Per Cent
Parental-Marital <sup>a</sup>	94	27	29	13	2	15	62	17	27	19	8	42
Sibling-Lodgings <sup>b</sup>	39	4	10	9	1	11	25	2	8	5	1	20
TOTAL	133	31	23	22	3	14	87	19	22	24	9	38

<sup>a</sup> Violence not classifiable for 6 patients: 4 relieved and 2 not improved.

<sup>b</sup> Violence not classifiable for 3 patients: 2 relieved and 1 not improved.

LIVING GROUP	MONTHS OF WORK IN FIRST YEAR				MONTHS OF WORK IN FIRST YEAR			
	Total	Less Than 1 Mo. or None	1-5 Mos.	6-12 Mos.	Total	Less Than 1 Mo. or None	1-5 Mos.	6-12 Mos.
	NUMBER OF PATIENTS				PER CENT OF TOTAL IN SPECIFIED WORK GROUP			
Hostel	13	5	4	4	100	38	31	31
Marital	14	6	2	6	100	43	14	43
Parental	86	47	13	26	100	55	15	30
Sibling	24	9	3	12	100	38	13	50
Lodgings	18	2	0	16	100	17	0	83
TOTAL	155	69	22	64	100	45	14	41
	NUMBER OF "FAILURES"				PERCENTAGE "FAILURES" IN SPECIFIED WORK GROUP			
Hostel	7	4	2	1	54	80	50	25
Marital	7	5	1	1	50	83	50	17
Parental	31	26	5	0	36	55	38	0
Sibling	4	4	0	0	17	44	0	0
Lodgings	0	0	—	0	0	0	—	0
TOTAL	49	39	8	2	32	57	36	3

Table 12. Amount of time spent at work during the first year of discharge for patients in different living groups and "failures" by months of work and living group.

category "moderately disturbed" various degrees of disturbance were equally distributed in each of these living groups.

12. *Work History.* Table 12 shows the amount of time spent at work during the first year of discharge. 14 per cent of the population worked for 1 to 5 months, and 41 per cent worked over 6 months—most of these approaching 12 months' work. There is a very high relationship between employment and "failure" rates. Of the 22 who worked for 1 to 5 months, 9 "failed," and of the 64 who worked for over 6 months only 1 patient "failed."

There are many more unemployed in *parental* than in the combined *sibling/lodgings* group (55 per cent and 26 per cent respectively— $p < .01$ , 1 d.f.). There is a higher "failure" rate for those unemployed in *marital* and *hostel* than in *parental* groups.

Many of the "successes" who worked for 6 to 12 months still showed some residual symptoms—sufficiently marked in a third of these cases to earn them the rating "moderately disturbed." This suggests that work history and behavioral ratings are to some extent independent. In some instances the patient's work record may be a more important factor in his "success" or "failure" than the presence or absence of psychotic symptoms.

Other stratifications were carried out for the following items: 13. Whether the chief pressure for patient's discharge came from the patient, his family, or the hospital. 14. Type of residence in terms of physical separation from neighbors. 15. Economic level of household. 16. Number of persons. 17. Sex ratio

Table 13. Social adjustment scores for "successes" by hospital discharge category and living group.

DISCHARGE CATEGORY AND LIVING GROUP	NUMBER WITH SPECIFIED SCORE			PER CENT WITH SPECIFIED SCORE		
	Total	3 + 2	1 + 0	Total	3 + 2	1 + 0
Total "Successes"	106	66	40	100	62	38
Hostel	6	4	2	100	67	33
Marital	7	4	3	100	57	43
Parental	55	28	27	100	51	49
Sib.-Lodgings	38	30	8	100	79	21
Recovered—Total	20	15	5	100	75	25
Hostel	—	—	—	—	—	—
Marital	3	1	2	100	33	67
Parental	8	5	3	100	63	37
Sib.-Lodgings	9	9	—	100	100	—
Relieved—Total	73	48	25	100	66	34
Hostel	4	3	1	100	75	25
Marital	4	3	1	100	75	25
Parental	40	22	18	100	55	45
Sib.-Lodgings	25	20	5	100	80	20
Not Improved—Total	13	3	10	100	23	77
Hostel	2	1	1	100	50	50
Marital	—	—	—	—	—	—
Parental	7	1	6	100	14	86
Sib.-Lodgings	4	1	3	100	25	75

of household. 18. Age of key persons. 19. Incapacitating illness in key persons. 20. Social class.

None of these was shown to affect the results except that all "middle class" kin groups tended to have high "failure" rates. Among the 15 patients who went to *siblings* in the "working class," there was only 1 "failure": in the "middle class" group there were 6 "successes" and 3 "failures." However, because of the small number in the "middle class" category these results can only be suggestive.

21. *Social Adjustment.* The superior social adjustment scores of "successful" patients in the *sibling/lodgings* group compared with the *parental* group were shown in Table 5. Table 13 shows that this difference persists when only those patients in the "discharged relieved" category are considered ( $< .05$ , 1 d.f.). It persists also when patients are subdivided as those who left hospital "on advice" or "against advice."

The results suggest that patients in the *parental* category tend to fail to reach standards of social adjustment achieved by patients in other groups.

22. *Changes in Living Groups on Leaving Hospital.* The domestic arrangements of patients in the year before the key admission were compared with those to which they returned. A change of living group was highly related to "success."

Table 14 shows that patients discharged "relieved" who changed living groups had a significantly lower percentage of

Table 14. "Failures" among patients who did and who did not return to their preadmission living group by hospital discharge categories.

CHANGE IN LIVING GROUP	ALL PATIENTS			RECOVERED			RELIEVED			NOT IMPROVED		
	Total	Failures		Total	Failures		Total	Failures		Total	Failures	
		No.	Per Cent		No.	Per Cent		No.	Per Cent		No.	Per Cent
Change	38	6	16	6	0	0	22	2	9	10	4	40
No Change	116	43	37	16	2	13	77	25	32	23	16	69
TOTAL <sup>1</sup>	154	49	32	22	2	9	99	27	27	33	20	61

<sup>1</sup> Change not known for 1 patient.

"failures" ( $p < .02$ , 1 d.f.). This was true also for both those who had left hospital "on advice" and those who had left "against advice."

14 of the 22 patients in the "relieved" category who changed living groups came from *marital* and *parental* groups and all 14 "succeeded." The other 8 came from *army* (4-S), *hostel* (1-S), *other kin* (1-F) and *lodgings* (1-S, 1-F).

Those who had been violent before admission and who changed their living group had a smaller proportion of "failures" (4 out of 19) than those who had been violent and had not changed (21 out of 44) ( $p < .05$ , 1 d.f.); the same proportions occur when the "relieved" group only is considered ( $p = .032$ ).

Patients who changed their living group also had slightly higher social adjustment scores but the differences did not reach statistical significance. ( $p > .10$ , 3 d.f.).

#### V. COMPARISON WITHIN TYPES OF LIVING GROUP

In studying complex interpersonal relationships we have relied on interview ratings amplified by descriptive accounts. These were informative, especially when, as was the case in rather less than half the interviews, the patient and key informant were seen together. Inevitably, in cases where the patient had returned to hospital several years before, there was a risk of distortion in the informant's account of what had taken place.

*Parental Group* (86 patients). All but 3 of the 86 schizophrenic patients returning to *parental* groups had a mother to receive them: in 55 per cent both parents were at home. In 19 per cent the mother lived alone with the patient, but in 51 per cent other relatives (usually one or more sibs of the patient) were also present. Analysis failed to reveal any statistical relationship of significance between patient's outcome and the composition of the parental household.

If "working" was defined as being employed for more than half of the first year for "successes," and more than half their

discharge period for "failures," then 3 of the 29 thus "working" and 28 of the 58 "not working" were found to have been readmitted within the year. There was thus a low "failure" rate in the working group but also a large proportion of "successes" among those not working. The threefold rating of behavior at the end of the first year or on readmission showed that the non-working group were more disturbed than the working group. This was so even when those rated as "not improved" at discharge were excluded.

The results and interviews suggested that continuous close contact between a patient and relative was sometimes a strain to both and might contribute to the different percentage of "failures" of the working and non-working patients.

In Table 15 patients who lived with their mothers are divided into two categories according to whether mother or patient left the house to work (*interrupted* personal contact) or both remained at home unemployed (*continuous* personal contact).

The percentage of "failures" in these categories were 16 and 55 per cent respectively. Even omitting those patients who worked (who were found to be slightly less disturbed), the differences remained between the categories showing *continuous* and *interrupted* personal contact ( $p < .05$ , 1 d.f.).

It might be supposed that the more disturbed the patient, the greater the tendency for his mother not to work. However, the "mother-working/patient-not-working" group did not contain

Table 15. "Failures" and amount of social contact as measured by mothers' and patients' work history, for discharged patients living with mothers.

PATIENTS' WORK HISTORY	TOTAL			MOTHER WORKING			MOTHER NON-WORKING		
	Total	"Failures"		Total	"Failures"		Total	"Failures"	
		No.	Per Cent		No.	Per Cent		No.	Per Cent
Working	29	3	10	9	2	22	20	1	5
Non-working	55	26	47	15	4	27	40*	22*	55*
TOTAL	84	29	35	24	6	25	60	23	38

\* Denotes the continuous contact category.

significantly more patients rated as "recovered" and "relieved" at discharge than that in which neither the patient nor his mother were employed. Nor were the 22 "failures" in the "continuous contact" category given worse ratings at discharge than the 18 "successes" in the same category. This suggests that continuous personal contact in the home may be associated with deterioration in the patient's behavior or lessening of the mother's tolerance.

Seven broad subgroups could be identified among these patients.

1. "Success"—*Very Disturbed* (5 patients). Great devotion by some member of the household was found in this group, sometimes with indications of pathological relationships as in the case of one patient who was largely under the care of a schizophrenic father.

2. "Success"—*Disturbed* (4 patients). All these patients showed very dependent relationships. It is doubtful if any could have worked.

3. "Success"—*Lesser Disturbance—No Work—Dependent* (14 patients). This was the main group in non-working "successes." In most of these cases there was evidence of great devotion by the mother and child-like dependency on the part of the patient. Many of these patients were judged to be probably capable of some work, but there was no indication of pressure for them to make the effort.

4. "Success"—*Lesser Disturbance—No Work—Independence* (6 patients). There were 6 patients among the "successes" who, though not working, seemed to have less dependent relationships with family members, who were more or less content to leave them alone.

5. "Success"—*Work* (26 patients). Many of these patients had residual psychotic symptoms, sometimes quite marked. On the whole they seemed to be relatively free from the extreme over-protectiveness noted in the non-working group—only 9 out of the 26 definitely had such relationships. In many families our notes clearly stated that the patient tended to keep apart.

6. "Failures"—*Very Disturbed* (8 patients). According to the descriptions given by our informants, 8 of the "failures" were



very disturbed at discharge, and caused considerable disruption at home. They were all rated "not improved" at discharge.

7. "Failures"—Not "Very Disturbed" (22 patients). The 22 other "failures" were more difficult to characterize. There was evidence that many deteriorated after discharge. Hostile relationships with the parents were reported far more frequently, and over-protective relationships less frequently than the "successes" living with parents.

In *parental* groups there was, therefore, evidence from those who "succeeded" that at least half entered child-like relationships of dependence; this was found especially among those not employed. The impression gained at interviews was that many of these patients could have worked, if only under sheltered conditions.

*Marital* (14 patients, of whom 7 "failed," 7 "succeeded"). Five of the wives lived alone: the rest lived with children of various ages. There were 22 children in all involved, the family size varying from 1 to 7, and the children's ages from 5 years to 23 years. 6 children were 20 or over, and 7 were 10 or less. There was no significant relationship between family composition and "failure" rates.

In this category 6 of the 7 "successes" were employed and 6 of the 7 "failures" were not. 8 of the 14 patients had definite delusions centered on their wives. Although deluded and violent, they could put on a good front to outsiders. There also seemed a greater pressure to work. Only in one patient was there anything approaching a child-like dependence on his wife; there were 7 children in this family with ages ranging from 17 to 6. There were two examples of what seemed complete recovery, one of the patients having been in hospital 17 years. However, one is most aware in this small series of the terrible suffering a schizophrenic patient may bring to relatives. Indeed, two of the most disturbed patients in the whole sample lived with wives: both worked and "succeeded." In several instances only the fact of *interrupted* social contact seemed to have made life bearable for the wife.

*Sibling* (24 patients, of whom 4 "failed," 20 "succeeded"). 8 of the siblings lived alone with the patient: in 5 instances there was more than one sibling, and 9 siblings were married. In 4 the main sibling was a brother.

Most of the "successes" worked and in none was there *continuous* contact within the home. There was only one definite example of a child-like relationship with a sibling and there is evidence that, although many had quite marked or residual symptoms, the delusions were not directed within the living group. Compared with *parental* and *marital* groups the relationships impress one as being much less intense.

None of the 4 "failures" in this group were employed. Two were very ill at discharge and rated "not improved" by the hospital. The third was not obviously ill but was sent back at once by his sister who did not want him. The fourth deteriorated and was sent back by his brother-in-law after eleven months.

*Lodgings* (18 patients, of whom none "failed"). All 18 of the patients in this group "succeeded." They had, on the whole, high social adjustment scores, only 3 dropping more than one point. 2 patients did not work during the first year: one of these was supported by his family, and the other had a pension.

The overwhelming impression gained from this group is one of social isolation. Only 4 patients showed evidence of mixing socially in the place of residence, and only 4 showed evidence of personal relationships of any intensity with relatives or acquaintances.

11 of these patients showed evidence of at least slight delusional systems—mostly of a paranoid nature.

*Hostel* (13 patients, of whom 7 "failed," 6 "succeeded"). This small group of 13 patients is considerably more heterogeneous in nature than any other group. 4 of the 6 "successes" worked—the other two were on public assistance. 4 of the 7 "failures" were returned by the police. In two cases there was evidence of severe drunkenness. Two at least appear to have been seriously ill at discharge. It is possible that the hostels'

low expectations with regard to their inmates' behavior and financial condition are factors in these results; but the patients' clinical state was probably a major factor. Relatively more patients rated "not improved" on discharge were found in hostels than in any other living group (67 per cent—cf. Table 6).

#### VI. DISCUSSION

The original finding that the outcome of chronic schizophrenic patients after leaving hospital, whether measured in terms of success in staying out of hospital for one year, or of level of social adjustment at the end of the year, was significantly associated with the type of living group to which they went has been subjected to further analysis. This has suggested that the differences in outcome were not due simply to the acceptance of clinically worse patients into *parental* and *marital* living groups.

The differential "failure" rates imply that it may not always be beneficial for such schizophrenic patients to return to the close emotional ties of *parental* and *marital* groups. A definite tendency towards seclusion and lack of close personal ties was noted in many patients living with *siblings*, and more especially in patients living in *lodgings*. However, it must remain at present speculative whether, in high "failure" rate living groups, actual deterioration in behavior could be attributed to post-hospital experiences. The following pieces of evidence were suggestive of this. Reported outburst of temper and violence occurred relatively more frequently with wives and parents but the incidence of other psychotic symptoms such as delusions was comparable in all living groups. Continuous interpersonal contact of the patient all day with the mother was related to higher "failure" rates. This may have been due to tendencies toward greater deterioration in behavior or toward decreased tolerance of members of the household in such circumstances. There were lower "failure" rates in patients changing their living groups on discharge from hospital, perhaps related to their not returning to previously stressful environments.

There was evidence that the degree and kind of behavior disorder could not solely explain the differences in "failure" rates. Differences in tolerance were suggested as a partial cause.

It has been appreciated by psychiatrists that it may not always be in the schizophrenic patient's best interests for him to be returned to his family; and two recent ecological studies dealing with admissions to mental hospital have actually argued in favor of the "beneficial" aspects of social isolation. Gerard and Houston, in a study of family setting and residential stability of 305 male schizophrenics admitted to the State Hospital from the city of Worcester, Massachusetts (6), advanced the hypothesis that a "mode of protection from disturbing close relationships for the single or divorced schizophrenic is the avoidance of meaningful communications or relationships through residential instability." Hare in similar studies (7, 8) in Bristol, England, put forward a similar hypothesis. Such hypotheses are consistent with our finding that no relapses occurred during the first year after discharge among those patients who went to live in lodgings, although these studies supply no direct evidence of the beneficial effects of such a life for schizophrenics.

The second major finding concerning the relatively low social adjustment scores of patients returning to parents has received tentative support from somewhat similar studies carried out by Simmons and his colleagues in Boston which were received after our analysis was complete (9, 10). These studies confirm that schizophrenics can remain out of hospital when they are actively psychotic and socially withdrawn. The main study (10) involved 182 cases of non-organic psychotic patients who had been in mental hospital over 45 days. Only *parental* and *marital* groups were analyzed. In this, as in the previous pilot study (9), "failure" rates were much the same in both types of group but it was shown that among the "successes" patients living with their wives showed a higher level of social adjustment than did patients living with their parents. They emphasized the child-like role that patients tended to assume in *parental* groups.

Although numbers in the *marital* category of our study are

small, they clearly support these findings. Unfortunately the Boston study includes no evidence on patients returning to *lodgings* and *sibling* groups. Our data suggest that higher social expectations, especially in the area of employment, in *sibling*, *lodgings* and *marital* groups stimulate "successful" patients to higher levels of achievement than if they had returned to the often lower expectations of *parental* groups. Freeman and Simmons have the same thought: "return of a patient to the parental family, where there is less likely to be an expectation of instrumental performance, may well occasion regression from, rather than movement toward, better functioning, and eliminate any gains of a therapeutic hospital experience" (10).

The possibility has been examined that the different incidence of employment in the various types of living group might simply reflect differences in the clinical state of the patients concerned. However, both the evidence reported and observations of the domestic situation at interviews suggest that ability to work is to some extent independent of clinical state; and also that work itself may play a therapeutic role.

There are three relevant questions which this study did not directly tackle. Firstly, whether or not a patient had alternative living groups to which he might go, and, secondly, whether he exercised choice in selecting from a number of possible alternatives. For example, it is very probable that while parents are alive unmarried patients will generally return to them. If, however, the parents are dead or the patients choose to go elsewhere, their choice of domicile is potentially wide and their ultimate destination will be influenced by the declared readiness or unwillingness of some of these alternative hosts to accept them. Such a mutual selective procedure might lead to greater chance of interpersonal adjustment. This leads to the third question. It is possible that the outcome might be the result of interactions between the personalities of the patient and his host which change in character during the year following discharge.

The major aim of this study was to provide an account of the

experiences of discharged chronic patients. Such an aim was incompatible with the direct control of such possible biasing factors as age and clinical state at discharge for patients returning to different settings. Examination of the three questions just listed and of hypotheses arising from this study can only be dealt with by the adequate control of such factors in a planned study—preferably carried out from the time of the patient's discharge.

#### SUMMARY

1. A follow-up enquiry was carried out for 156 schizophrenic patients discharged after more than two years' stay in mental hospital.

2. 68 per cent of the schizophrenic patients succeeded in remaining out of hospital for at least one year after discharge.

3. Ability to remain out of hospital and level of social adjustment were related to the type of living group to which the patients went: patients staying with siblings and in lodgings did better than those staying with parents, with wives and in large hostels.

4. The data available regarding severity of illness at time of discharge from the hospital suggest that the results were not attributable to more severe clinical conditions in those who went to live with parents or wife than in those who went to siblings or lodgings.

5. The influence of social factors on the behavior of patients is discussed.

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## PROJECTIONS OF MORTALITY IN THE UNITED STATES TO 1970

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THE two major objectives of this paper are: *First*, to ascertain the projected age-sex specific mortality rates of United States white and nonwhite populations for the years 1960, 1965, and 1970; and *second*, to establish the future life expectancy at selected ages for these four race-sex population groups based upon hypothetical life tables derived from projected death rates.

Numerous mortality projections, employing a variety of techniques, have been prepared and experience has proved many of these forecasts to be unduly conservative.<sup>2</sup> Also, data for recent years indicate that Dorn's projections are rather conservative.<sup>3</sup> For example, mortality rates from 1948 to 1955 decrease to such an extent that the expectation of life in 1955, especially for the white population, had nearly attained his projected values for 1960.

Mortality projections serve four major purposes: *First*, projected survival rates are essential for developing population projections;<sup>4</sup> *second*, mortality forecasts serve as a basis for estimating premiums, annuities, and reserves by life insurance companies; *third*, they are necessary for preparing future cost estimates for the Old-Age, Survivors and Disability Insurance program; and *fourth*, they provide estimates of mortality

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<sup>2</sup> Wolfenden, Hugh H.: *POPULATION STATISTICS AND THEIR COMPILATION*. Chicago, The University of Chicago Press, 1954, Chapter X; Spiegelman, Mortimer: *INTRODUCTION TO DEMOGRAPHY*. Chicago, The Society of Actuaries, 1955, Chapter 6; and Dublin, Louis I.; Lotka, A. J.; and Spiegelman, Mortimer: *LENGTH OF LIFE*. New York, The Ronald Press Co., 1949, Chapter 9.

<sup>3</sup> Dorn, Harold F.: Prospects of Further Decline in Mortality Rates. *Human Biology*, December, 1952, 24, No. 4, pp. 235-61.

<sup>4</sup> These United States death rate projections were developed primarily for use in preparing Oklahoma population projections, with the projected state mortality levels being tied in with corresponding national computations.



rates, assuming the application and acceptance of existing medical knowledge.

#### MORTALITY PROJECTION PROCEDURE

In computing 1960, 1965, and 1970 projected United States race-sex mortality rates, it was assumed that age-specific death rates will decline asymptotically throughout 1955-1970. These rates were projected, using conventional punch card tabulation machinery and an IBM 650 computer, by the following procedure:

*First*, the annual United States age-specific death rates for the 25-year period 1930-1954 were extrapolated to 1970. Straight line and parabolic fits were obtained for the natural logarithms of age-specific mortality rates versus years coded with 1930 as zero. Exponential curves were computed by the least squares method using the following two formulas:

$$\text{Straight line: } \log y = a + bx \quad (1)$$

$$\text{Parabolic: } \log y = a + bx + cx^2 \quad (2)$$

*Second*, the resulting two sets of 1960, 1965, and 1970 age-race-sex extrapolations obtained by fitting exponential curves were then compared and one was chosen. Table 1 shows the coefficients for the selected mathematical fits to the 1930-1954 mortality data.

*Third*, erratic and unrealistic projections were obtained for white males 55-59 and 85 years of age and over, nonwhite males 75 years of age and over, and for nonwhite females 70 years of age and over. Adjustments were necessary in these cases, requiring the elimination of inconsistent projected death rates.

The recorded age-specific United States death rates for the four race-sex populations at every fifth year from 1930 through 1955 and the 1960, 1965, and 1970 projections are shown in Tables 2 and 3. The prospective changes during the 15-year period 1955-1970 reflect a continuation of past trends, one of steadily declining mortality rates.

Table 1. Table of coefficients for curves fitted to annual mortality rates 1930-1954.

Age	WHITE MALE			WHITE FEMALE			NONWHITE MALE			NONWHITE FEMALE		
	A	B	C	A	B	C	A	B	C	A	B	C
Under 1	-2.68102	-.04011	.00020	-2.91778	-.04011	.00010	-2.23427	-.03152	.00006	-2.41696	-.03326	.00005
1-4	-5.12937	-.07014		-5.24469	-.07744	.00021	-4.61074	-.06619		-4.74263	-.06679	
5-9	-6.18139	-.05097		-6.36280	-.06251	.00005	-5.95519	-.04845		-6.03253	-.05563	
10-14	-6.35170	-.04379		-6.61230	-.05601		-5.86900	-.04950		-5.83963	-.06924	
15-19	-5.99950	-.02952		-6.17604	-.05715		-5.11347	-.04817		-4.88413	-.07320	
20-24	-5.70417	-.02530		-5.73287	-.06805		-4.59837	-.04650		-4.54916	-.06727	
25-29	-5.56427	-.03706		-5.57684	-.06589		-4.44995	-.04699		-4.48060	-.06096	
30-34	-5.38815	-.03818		-5.47427	-.05665		-4.24224	-.04593		-4.33541	-.05212	
35-39	-5.15684	-.03169		-5.32636	-.04501		-4.11813	-.03920		-4.27517	-.04044	
40-44	-4.84139	-.02488		-5.07474	-.03854		-3.86949	-.03375		-3.98752	-.03516	
45-49	-4.52049	-.01699		-4.79508	-.03083		-3.71357	-.02390		-3.85078	-.02612	
50-54	-4.19818	-.00943		-4.46193	-.02641		-3.50244	-.01186		-3.49771	-.02284	
55-59	-3.82814*	-.00616*		-4.07527	-.02447		-3.32160	-.00888		-3.26908	-.02395	
60-64	-3.45629	-.00555		-3.66649	-.02271		-3.13504	-.00673		-3.11142	-.01797	
65-69	-3.08546	-.00567		-3.25994	-.01996		-2.94537	-.00166		-3.03829	-.00810	
70-74	-2.66647	-.00779		-2.79186	-.01837		-2.61794	-.00896		-2.74184*	-.01475*	
75-79	-2.21407	-.00880		-2.32493	-.01580		-2.31394*	-.01001*		-2.53149*	-.01045*	
80-84	-1.79584	-.01004		-1.90447	-.01340		-1.95524*	-.02035*		-2.28277*	-.01480*	
85+	-1.37945*	-.00597*		-1.44059	-.00880		-1.49380*	-.02210*		-1.73672*	-.02056*	

\* Apparent inconsistencies and random irregularities were adjust-d. Therefore, these coefficients were not employed in 1960, 1965, and 1970 mortality projections.

The 1970 projections, for example, indicate that death rates will be lower in every age-race-sex population group than in 1955. Infants and young adults have benefited most from

Table 2. Death rates by age for white males and females, United States 1930-1955, and projected rates for 1960, 1965, and 1970.

AGE	YEAR								
	1930	1935	1940	1945	1950	1955	1960	1965	1970
WHITE MALES									
Under 1	66.6	58.1	48.3	39.9	30.2	29.8	24.6	21.5	19.0
1 - 4	5.5	4.4	2.8	2.0	1.4	1.1	.7	.5	.4
5 - 9	2.0	1.7	1.2	1.1	.7	.6	.5	.4	.3
10-14	1.6	1.5	1.1	1.0	.7	.6	.5	.4	.3
15-19	2.5	2.2	1.7	1.8	1.3	1.3	1.0	.9	.8
20-24	3.4	3.0	2.3	3.5	1.7	1.8	1.6	1.4	1.2
25-29	3.8	3.3	2.5	2.9	1.7	1.6	1.3	1.1	.9
30-34	4.4	3.9	3.1	3.1	2.0	1.8	1.5	1.2	1.0
35-39	5.5	5.0	4.1	4.1	2.9	2.6	2.2	1.9	1.6
40-44	7.6	7.2	6.1	5.6	4.8	4.2	3.7	3.3	2.9
45-49	10.3	10.3	9.2	8.4	7.7	7.1	6.5	6.1	5.6
50-54	14.6	14.3	13.9	13.3	12.1	11.4	11.3	10.8	10.3
55-59	21.0	21.2	20.9	20.6	18.8	17.5	17.5*	17.3*	16.7*
60-64	31.1	30.6	30.6	28.9	28.1	27.0	26.7	26.0	25.3
65-69	45.8	45.3	44.6	40.6	40.7	41.1	38.6	37.5	36.4
70-74	68.4	65.4	57.8	61.2	60.4	58.1	55.0	52.9	50.9
75-79	103.1	107.4	104.0	94.7	90.1	88.2	83.9	80.3	76.8
80-84	154.7	156.3	158.1	139.7	135.2	133.9	122.8	116.8	111.1
85 and Over	237.6	239.3	251.4	225.5	221.2	200.6	200.6*	200.6*	198.2*
WHITE FEMALES									
Under 1	53.2	45.2	37.8	31.1	23.1	22.4	17.9	15.1	12.8
1 - 4	4.8	3.8	2.4	1.7	1.1	.9	.6	.5	.3
5 - 9	1.6	1.4	.9	.7	.5	.4	.3	.2	.2
10-14	1.2	1.1	.8	.6	.4	.3	.3	.2	.2
15-19	2.1	1.6	1.2	.9	.6	.5	.4	.3	.2
20-24	3.0	2.4	1.6	1.3	.8	.6	.4	.3	.2
25-29	3.4	2.9	1.9	1.5	1.0	.7	.5	.4	.3
30-34	3.8	3.3	2.4	1.9	1.3	1.0	.8	.6	.4
35-39	4.6	4.0	3.1	2.7	1.9	1.6	1.3	1.0	.8
40-44	5.9	5.3	4.3	3.5	2.9	2.4	2.0	1.6	1.3
45-49	7.8	7.3	6.1	5.3	4.4	3.7	3.3	2.8	2.4
50-54	10.9	10.2	9.0	8.0	6.6	5.6	5.2	4.6	4.0
55-59	16.2	15.1	13.5	12.2	10.2	8.6	8.2	7.2	6.4
60-64	24.5	22.9	20.8	18.1	16.2	14.1	12.9	11.6	10.3
65-69	37.3	35.3	32.9	28.2	25.2	24.2	21.1	19.1	17.3
70-74	58.3	54.8	54.0	47.0	42.6	37.1	35.3	32.2	29.4
75-79	90.9	91.9	87.1	77.1	69.9	64.3	60.9	56.3	52.0
80-84	140.7	136.3	138.1	119.8	112.5	110.1	99.6	93.2	87.1
85 and Over	225.1	223.4	235.0	208.5	196.8	191.6	181.9	174.0	166.5

\* Apparent inconsistencies and irregularities were adjusted.

recent health progress and probably will experience the greatest relative reductions in mortality by 1970. Comparatively small declines will occur among the aged.

Table 3. Death rates by age for nonwhite males and females, United States 1930-55, and projected rates for 1960, 1965, and 1970.

AGE	YEAR								
	1930	1935	1940	1945	1950	1955	1960	1965	1970
NONWHITE MALES									
Under 1	108.7	91.6	82.2	63.2	48.9	57.0	41.6	35.5	30.4
1-4	10.0	7.1	5.3	3.5	2.7	2.1	1.4	1.1	.8
5-9	2.7	2.1	1.6	1.3	1.0	.7	.6	.5	.4
10-14	2.6	2.3	1.7	1.3	1.0	.8	.6	.5	.4
15-19	6.0	4.6	3.7	3.1	2.2	1.6	1.4	1.1	.9
20-24	9.7	7.8	6.5	6.1	3.7	3.0	2.5	2.0	1.6
25-29	11.0	9.6	7.7	6.4	4.3	3.7	2.9	2.3	1.8
30-34	13.5	11.3	9.4	8.1	5.7	4.3	3.6	2.9	2.3
35-39	14.9	14.5	11.2	9.1	7.0	6.3	5.0	4.1	3.4
40-44	19.7	17.9	15.4	12.7	10.4	8.8	7.6	6.4	5.4
45-49	23.4	21.5	20.5	17.4	14.6	12.6	11.9	10.6	9.4
50-54	29.8	28.0	29.4	25.0	23.4	19.3	21.1	19.9	18.7
55-59	36.7	33.6	34.3	30.2	31.4	27.3	27.7	26.5	25.3
60-64	45.3	43.8	40.8	34.9	39.2	38.3	35.6	34.4	33.2
65-69	59.3	49.3	58.0	45.8	54.1	56.7	50.0	49.6	49.2
70-74	80.2	67.2	70.2	59.4	63.7	66.6	55.8	53.3	51.0
75-79	101.7	92.2	98.5	79.8	82.9	71.7	71.7*	69.7*	66.3*
80-84	147.8	129.3	130.8	88.9	106.0	99.3	91.1*	86.6*	82.4*
85 and Over	228.5	192.8	199.7	165.1	160.2	103.3	103.3*	98.0*	92.8*
NONWHITE FEMALES									
Under 1	90.9	74.6	65.2	50.8	39.9	45.6	32.9	27.9	23.6
1-4	8.7	6.3	4.4	3.0	2.3	1.8	1.2	.9	.7
5-9	2.4	1.8	1.3	1.1	.8	.6	.5	.4	.3
10-14	2.7	2.1	1.5	1.1	.7	.5	.4	.3	.2
15-19	7.1	4.8	4.3	2.7	1.8	.9	.8	.6	.4
20-24	9.3	7.2	5.8	4.4	2.5	1.7	1.4	1.0	.7
25-29	10.4	8.3	6.7	4.7	3.3	2.3	1.8	1.3	1.0
30-34	11.9	9.9	8.2	6.4	4.6	3.3	2.7	2.1	1.6
35-39	13.4	11.3	9.8	7.8	6.1	5.0	4.1	3.4	2.8
40-44	17.7	15.1	14.2	11.5	9.2	6.7	6.5	5.4	4.5
45-49	21.4	18.0	17.6	14.4	12.5	10.1	9.7	8.5	7.5
50-54	30.2	26.4	25.8	20.8	19.4	15.6	15.3	13.6	12.1
55-59	38.5	33.6	30.7	26.0	24.0	21.0	18.5	16.5	14.6
60-64	45.1	41.2	36.4	30.8	32.4	28.5	26.0	23.8	21.7
65-69	54.4	43.1	48.0	38.3	42.4	44.1	37.6	36.1	34.7
70-74	68.4	58.3	58.7	47.0	51.6	50.4	46.9*	44.9*	42.8*
75-79	81.7	74.2	76.8	63.1	64.8	56.0	52.1*	49.9*	47.6*
80-84	107.3	90.3	98.2	72.9	81.7	79.9	74.4*	71.1*	67.9*
85 and Over	187.2	160.4	159.7	124.1	133.7	90.8	84.5*	80.8*	77.1*

\* Apparent erratic fluctuations were adjusted.

Also, females have profited to a greater extent than males from mortality reduction in the advanced ages. These sex differences will widen even more by 1970, as in both races aged females will experience proportionately greater reductions in death rates than will males.

In general, the proportionate declines in the death rates of young persons of both races and sexes will be approximately equal. However, in the productive and advanced ages, the death rates of nonwhite males are likely to fall relatively more than those for white males. In contrast, mortality rates will decline more rapidly for white than for nonwhite females in these age groups.

#### PROJECTED CHANGES IN LIFE EXPECTANCY

Hypothetical abridged life tables were prepared by sex and race for the United States population, using 1960, 1965, and 1970 projected age-specific death rates in each case. The separation factors ( $f$ ) for the population under 1 year of age were computed by the following formulas:<sup>5</sup>

$$L_0 = fl_0 + (1-f)l_1, \text{ where} \quad (3)$$

$$f = \frac{L_0 - l_1}{l_0 - l_1} \quad (4)$$

Greville's method of abridged life table construction was employed.<sup>6</sup>

<sup>5</sup> The separation factors ( $f$ ) for United States race-sex groups age 0-1 were projected to 1970, by the least squares method by fitting a straight line to 1929-1931, 1939-1941, and 1949-1951  $f$ 's from United States life tables. For nonwhite males and females, the  $f$ 's from the 1929-1931 United States Negro life tables were used. The projected  $f$ 's for the four population groups, by years, are as follows:

	1960	1965	1970
White Males	.07254	.05077	.02900
White Females	.09039	.07016	.04993
Nonwhite Males	.11525	.09346	.07168
Nonwhite Females	.12683	.10646	.08610

<sup>6</sup> Greville, T. N. E.: Short Methods of Constructing Abridged Life Tables. *The Record of the American Institute of Actuaries*, June, 1943, XXXII, Part One, No. 65, pp. 29-42; and Dublin, Louis I.; Lotka, A. J.; and Spiegelman, Mortimer: *LENGTH OF LIFE*. New York, The Ronald Press Company, Revised Edition, 1949, pp. 312-16.

Continued expansions of medical knowledge and widespread application of sanitation practices will, of course, swell the numbers surviving at various ages throughout the life span. These anticipated gains between 1955 and 1970 are shown in the increasing numbers living at the beginning of each age interval, *lx* values in actuarial notation, and are taken from 1955 life tables and hypothetical 1970 life tables (Table 4). For instance, notable increases in the number of persons out of every cohort attaining age 1 will occur between 1955 and 1970. According to these figures, the number of white male infant deaths out of each cohort of 100,000 born will decline from 2,675 in 1955 to 1,882 in 1970. The corresponding 1955 and 1970 infant deaths are 2,037 and 1,272 for white females; 4,722 and 2,995 for nonwhite males; and 3,886 and 2,333 for nonwhite females.

The increased chances of survival will prolong lives, aug-

Table 4. Number surviving to specified ages out of 100,000 born alive, by color and sex, United States, 1955\* and 1970.

AGE	WHITE MALE		WHITE FEMALE		NONWHITE MALE		NONWHITE FEMALE	
	1955	1970	1955	1970	1955	1970	1955	1970
0	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
1	97,325	98,118	97,963	98,728	95,278	97,005	96,114	97,667
5	96,906	97,961	97,614	98,610	94,506	96,695	95,423	97,394
10	96,641	97,814	97,429	98,511	94,171	96,502	95,153	97,248
15	96,360	97,667	97,271	98,413	93,790	96,309	94,907	97,151
20	95,743	97,277	97,013	98,314	93,046	95,877	94,485	96,957
25	94,891	96,695	96,703	98,216	91,649	95,112	93,698	96,618
30	94,134	96,261	96,342	98,069	89,957	94,260	92,645	96,136
35	93,307	95,781	95,860	97,873	88,059	93,182	91,136	95,370
40	92,092	95,018	95,113	97,482	85,237	91,610	88,805	94,043
45	90,183	93,649	93,969	96,850	81,601	89,167	85,960	91,949
50	87,044	91,060	92,235	95,695	76,482	85,066	81,624	88,560
55	82,188	86,481	89,662	93,798	69,483	77,448	75,528	83,350
60	75,276	79,532	85,854	90,841	60,612	68,204	67,948	77,466
65	65,704	70,039	79,982	86,272	50,005	57,711	58,944	69,470
70	53,375	58,312	70,755	79,101	37,511	45,022	46,975	58,338
75	39,735	45,098	58,621	68,232	26,768	34,802	36,562	47,018
80	25,372	30,544	42,257	52,475	18,632	24,878	27,562	36,980
85 and Over	12,717	17,214	24,005	33,700	11,237	16,370	18,409	26,218

\* Source: United States Department of Health, Education, and Welfare, Public Health Service, National Office of Vital Statistics; Abridged Life Tables: United States, 1955, Vital Statistics—Special Reports, National Summaries, July 2, 1957, 46, No. 9.

menting the number of persons living to working age and add to the growing number of persons reaching age 65 and over. Over 70,000 white males and 86,000 white females out of every 100,000 born in 1970, assuming they are subject throughout life to projected mortality rates for that year, can expect to attain age 65, compared to 65,700 white males and 80,000 white females in 1955.

At birth, the life expectancy, or  $e_x$  values in actuarial notation, implied in United States age-specific mortality projections, as compared to 1949-1951 and 1955 experience, is as follows:

	1949-1951	1955	1960	1965	1970
White Males	66.3	67.3	68.5	69.4	70.3
White Females	72.0	73.6	75.1	76.5	77.8
Nonwhite Males	58.9	61.2	63.3	65.1	66.8
Nonwhite Females	62.7	65.9	68.6	70.8	72.8

Because life expectancy, from birth onward, increases more rapidly for females than for males, these differentials will be even greater in 1970 than at present. In 1955, the average life expectancy at birth was 6.3 years greater for white females than for white males, and by 1970 it will be 7.5 years greater. For nonwhites, it was 4.7 years greater for females than for males in 1955, and by 1970 it will be 6.0 years greater. This marked trend will augment the growing excess of females over males at older ages. Also, it increases the probability that wives will outlive their husbands, further enlarging the proportions of widowed females in this country and lengthening the period of widowhood of women bereft of their husbands.

According to these projections, one may anticipate gains in human longevity of 3.0 years for white males, 4.2 years among white females, 5.6 years for nonwhite males, and 6.9 years among nonwhite females between 1955 and 1970. Therefore, the above projections indicate a relatively greater increase in the life expectancy at birth for nonwhites than for whites, and a greater improvement for females than for males.

The proportionate increases in life expectation between 1955

and 1970 are most pronounced in infancy and childhood, diminishing as age increases (Table 5). For example, white males born in 1970 may expect to live three full years longer than those born in 1955, whereas white males reaching age 80 in 1970 may expect only .7 of a year more life than those of the same age in 1955.

At 70 years of age and over, nonwhites of both sexes live longer than whites. (It is very likely that errors in basic vital statistics account for part of this variation.) By 1970, nonwhites have prospects of greater increases in life expectancy than whites of these same ages.

Coincident with the anticipated reductions in mortality during the 15-year period, the chances of survival from birth to the productive ages will increase markedly. Also, substantially more of those in the working ages in 1970 can look forward to surviving until retirement. For example, a white male worker

Table 5. Average remaining lifetime in years at specified ages, by color and sex, United States, 1955\* and 1970.

AGE	WHITE MALE		WHITE FEMALE		NONWHITE MALE		NONWHITE FEMALE	
	1955	1970	1955	1970	1955	1970	1955	1970
0	67.3	70.3	73.6	77.8	61.2	66.8	65.9	72.8
1	68.2	70.6	74.2	77.8	63.2	67.8	67.5	73.5
5	64.5	66.7	70.4	73.9	59.7	64.0	64.0	69.7
10	59.6	61.8	65.6	69.0	54.9	59.2	59.2	64.8
15	54.8	56.9	60.7	64.1	50.1	54.3	54.3	59.9
20	50.1	52.2	55.8	59.1	45.5	49.5	49.6	55.0
25	45.6	47.4	51.0	54.2	41.2	44.9	45.0	50.2
30	40.9	42.6	46.2	49.3	36.9	40.3	40.5	45.4
35	36.3	37.9	41.4	44.4	32.6	35.7	36.1	40.8
40	31.7	33.1	36.7	39.5	28.6	31.3	32.0	36.3
45	27.3	28.6	32.1	34.8	24.8	27.1	27.9	32.1
50	23.2	24.3	27.7	30.1	21.3	23.2	24.3	28.2
55	19.4	20.5	23.4	25.7	18.1	20.3	21.0	24.8
60	16.0	17.0	19.3	21.5	15.4	17.6	18.1	21.5
65	12.9	14.0	15.5	17.4	13.2	15.4	15.5	18.6
70	10.3	11.2	12.2	13.8	11.7	14.0	13.8	16.7
75	8.0	8.8	9.2	10.6	10.4	12.3	12.0	15.1
80	6.1	6.8	6.7	8.0	8.9	11.2	10.1	13.5
85 and Over	4.8	5.0	5.0	6.0	8.2	10.8	8.9	13.0

\* SOURCE: United States Department of Health, Education, and Welfare, Public Health Service, National Office of Vital Statistics: Abridged Life Tables: United States, 1955, Vital Statistics—Special Reports, National Summaries, July 2, 1957, 46, No. 9.



who retired in 1955 at age 65 could expect to celebrate his 77th birthday, living almost to his 78th birth date. By 1970, one who retires at the same age can expect to reach his 79th birthday, living 1.1 years longer than in 1955. Correspondingly, a woman at age 65 in 1970 is likely to live nearly two years longer than one of the same age in 1955.

Moreover, the extension of average life expectancy, accompanied by a pronounced earlier withdrawal of older workers from the labor force, will protract the period of retirement, thereby accentuating existing gerontological problems. Wolfbein estimates that the average number of years spent by men in retirement has more than doubled since 1900, and current trends indicate a tripling of this figure by the year 2000.<sup>7</sup> For example, in the United States in 1900, a male worker 20 years of age could look forward to living 42.2 additional years, spending 39.4 years working and 2.8 years in retirement. By 1955, a male worker of the same age could expect to live 49.5 years, having a working life expectancy of 43.0 years and a period of retirement of 6.5 years.

#### SUMMARY

Age-specific death rates for the four United States race-sex population groups were projected to 1960, 1965, and 1970 by exponential curves using the least squares method. Straight line and parabolic fits were obtained for the natural logarithms of 1930-1954 age-specific mortality rates versus years coded with 1930 as zero. Then, 1960, 1965, and 1970 hypothetical abridged life tables were constructed to establish  $l_x$ ,  $dx$ ,  $e_x$ , and other life table values.

This paper has shown that:

*First*, the reductions in death rates during 1955-1970 will be much greater, proportionately, in infancy and early childhood than in the adult and advanced ages.

*Second*, at middle age and over, females will experience

<sup>7</sup> Wolfbein, Seymour L.: "The Length of Working Life." Mimeographed paper presented at the Fourth International Gerontological Congress, Merano, Italy, July, 1957, p. 5.

relatively greater reductions in mortality than males. This further will enlarge the excess of females over males, reduce the sex ratios in these age groups, increase the number of widows, and extend the duration of widowhood.

*Third*, diminished mortality will increase the chances of infants living to successive ages. This will augment the number reaching productive ages. Also, by 1970, over 70,000 white males out of each cohort of 100,000 born, as compared to 66,000 in 1955, can expect to attain age 65. The extension of average life expectancy will increase the number of persons aged 65 and over, further enlarging the number receiving Social Security retirement benefits. Accordingly this will lengthen the period workers spend in retirement, greatly intensifying problems associated with geriatrics.

*Fourth*, projected increases in longevity between 1955 and 1970, range from 3.0 years for white males to 6.9 years for nonwhite females. Nonwhites will experience a relatively greater increase than whites, while females will have proportionately greater gains than males.

*Fifth*, the rises in life expectancy between 1955-1970 will become progressively smaller as age increases. At ages 70 and over, the relative gains for nonwhites will surpass those for the whites.

These projections may seem optimistic, especially after the temporary 1957 reversal in the death rates concomitant with the widespread prevalence of Asian influenza and other respiratory infections.<sup>8</sup> Nevertheless, numerous factors and trends indicate further reductions in mortality. Apparently, a gradual and progressive diminution of death rates will continue for infants and young adults. On the other hand, the greatest possible mortality reductions lie among aged populations, especially males.

<sup>8</sup> The national "low mortality" estimates prepared by the Division of the Actuary of the Social Security Administration for the year 2000 yield an expectation of life at birth of 73.97 years for males and 78.87 years for females. Greville, T. N. E.: ILLUSTRATIVE UNITED STATES POPULATION PROJECTIONS. United States Department of Health, Education, and Welfare, Social Security Administration, Division of the Actuary, Actuarial Study No. 46, May, 1957, Table 5.

Appreciable reductions among the aged may occur, but they await the conquering of such degenerative diseases as those of the circulatory system, the respiratory system, and of the other vital organs, including the numerous forms of malignancy and other causes of death concentrated in old age. It seems likely that new advances and discoveries will arrest somewhat the high death rates of the aged. Nevertheless, it is quite improbable that the second half of this century can duplicate the accomplishments of the first half in increasing the average length of life. After all, the real accomplishment in mortality reduction is merely the postponement of death to later ages.

Health progress will continue, but its rapidity is unpredictable. Inasmuch as one cannot predetermine future age-specific death rates precisely, these forecasts are projections rather than predictions. Some degree of uncertainty attends any type of extrapolation, and the further one extends it, the greater the uncertainty becomes.

## CENSUS-NOVS STUDY OF DEATH CERTIFICATES MATCHED TO CENSUS RECORDS

LILLIAN GURALNICK<sup>1</sup> AND CHARLES B. NAM<sup>2</sup>

THE Bureau of the Census and the National Office of Vital Statistics have jointly conducted a small study in Memphis, Tennessee, to test the feasibility of a reliable larger-scale study of socio-economic differences in mortality.

The need for this study arose, specifically, out of efforts to find a way of obtaining more reliable data than we have had heretofore on mortality rates according to occupation. In the past, such data have been derived from the occupation reported on the death certificates filed during the census year and the population by occupation enumerated in the census. Differences in definitions of occupation on the death certificate and for the census, in reporting practices, and in coding have caused some doubt as to the accuracy of such rates. It has been suggested that the amount of variation produced by the three factors could be reduced by using the characteristics of the decedents given in the census schedules in place of those given on the death certificate. This might be accomplished by locating the census record for each individual who dies after the date of enumeration through the use of the name and address given on the death certificate.

Past attempts at matching death and census records have resulted in locating about 80 per cent of the decedents on the schedules. Analyses based on matched records alone thus might lead to biased results. The present study was planned to obtain information about the deceased persons who could not be located in the census records so that the causes for failure to match could be determined and better rates of matching achieved; in addition, the bias could be assessed by comparing the characteristics of the unmatched persons with those of the matched persons.

<sup>1</sup> National Office of Vital Statistics.

<sup>2</sup> Bureau of the Census.

An alternate suggestion for providing additional information about the deceased was developed in the second part of the study. A questionnaire which included items, related to possible mortality studies, that appeared in the census schedules was designed. It was planned to mail the questionnaire to the persons who had provided the information for the death certificate. If replies to the questionnaires were satisfactory, that is, corresponding to census entries, this might provide a more practical method of obtaining detailed information about the decedent. There was also the possibility that the queries would be returned with greater frequency than the known matching rate.

#### PROCEDURE

A special census of the City of Memphis had been taken as of January 31, 1958. One of its chief purposes was to test self-enumeration as a method of collecting census data. A week prior to the census date, a listing operation was carried out in which the address of each household and the name of the household head were recorded. At that time, the schedules were distributed to each dwelling unit with instructions requesting that the completed schedules be mailed to the census field office in Memphis. Entries on the schedules were made by a member of the household for the entire household, or if necessary, by a more competent person. Follow-up on 10 per cent of the sample households was made by the field office to obtain schedules from households that had not mailed them in. Special surveys were later conducted to check on the coverage of households and persons within households.

Death certificates for events occurring in Shelby County (in which the city of Memphis is located) are filed with the Shelby County Health Department and then forwarded to the State office. The Tennessee State Department of Health sent the National Office of Vital Statistics reproduced copies of all certificates of deaths occurring in Shelby County during the months of February and March 1958. Odd numbered certifi-

cates for February and even numbered for March constituted the study sample. Death certificates for illegitimate babies, for infants who were born after the date of the census, and for persons whose usual residence was outside the city limits of Memphis were eliminated, leaving 349 cases in the sample.

A questionnaire was sent out for each remaining death certificate. It was addressed to the person given as the informant. In cases for which the informant's name was not specified or the address was not clear, a letter was sent first to the funeral director or the State office of vital statistics requesting the name of a close friend or relative of the deceased, or a better address, where this was the problem.

The questionnaires were sent out from two to three months after the date of death. If no reply was received in two weeks, a follow-up letter and questionnaire was sent to the same informant. For deaths in February, the follow-up letters were sent by first class mail but for March the follow-up letters were sent by certified mail. The results of the mail inquiry are shown in Table 1.

All death certificates and the completed questionnaires were then forwarded to the Bureau of the Census, where location of the enumeration district which included the address of usual residence given on the death certificate, and of any other pertinent address given in the questionnaire, was determined. The appropriate folder of census schedules was then searched for the address and name of the decedent. If the individual could not be found at the usual place of residence, a search was made for the enumeration record at the other addresses given on the questionnaire. Of course, for the persons for whom the questionnaire had not been returned, only the address on the death certificate was available.

There were 60 persons who could not be located in the census records. Two census enumerators, working regularly in Memphis, were assigned the task of finding out if these persons were thought to have been enumerated and at what address. The purpose of the study was described to the enumerators and

COLOR AND SEX OF DECEDENTS	NUMBER					PER CENT DISTRIBUTIONS				
	Total	Under 45 Years	45-64 Years	65-74 Years	75 and Over	Total	Under 45 Years	45-64 Years	65-74 Years	75 and Over
A. All Certificates										
in Sample	349	46	112	95	96	100.0	13.2	32.1	27.2	27.5
White Male	109	15	30	35	29	100.0	13.8	27.5	32.1	26.6
White Female	86	12	12	19	43	100.0	14.0	14.0	22.1	50.0
Nonwhite Male	83	8	38	24	13	100.0	9.6	45.8	28.9	15.7
Nonwhite Female	71	11	32	17	11	100.0	15.5	45.1	23.9	15.5
B. No Response to Questionnaire	53	9	21	12	11	B/A				
White Male	7	2	1	1	3	15.2	19.6	18.8	12.6	11.5
White Female	8	1	2	2	3	6.4	13.3	3.3	2.9	10.3
Nonwhite Male	15	1	7	5	2	9.3	8.3	16.7	10.5	7.0
Nonwhite Female	23	5	11	4	3	18.1	12.5	18.4	20.8	15.4
C. Not Located in Census Record	60	12	27	14	7	C/A				
White Male	10	1	3	4	2	17.2	26.1	24.1	14.7	7.3
White Female	8	1	3	1	3	9.2	6.7	10.0	11.4	6.9
Nonwhite Male	21	3	13	3	2	9.3	8.3	25.0	5.3	7.0
Nonwhite Female	21	7	8	6	0	25.3	37.5	34.2	12.5	15.4
D. Not Located in Census Record but Responded to Query	39	7	19	9	4	29.6	63.6	25.0	35.3	—
E. Not Located in Census Record and No Response to Query	21	5	8	5	3	D/A				
						11.2	15.2	17.0	9.5	4.2
F. Located in Census Record but No Response to Query	32	4	13	7	8	E/A				
						6.0	10.9	7.1	5.3	3.1
						F/A				
						9.2	8.7	11.6	7.4	8.3

Table 1. Distribution by age, color, and sex of a sample of decedents, by extent of matched records, Memphis, February-March, 1958.

they were provided with instructions and asked to complete special forms for each decedent. Some information was obtained about every case. In addition, for all persons not located in the census records who had died in a hospital, the date of admission to the hospital was obtained by the State Department of Health. This date served to determine if the deceased was actually in the hospital or institution on the date of enumeration.

## RESULTS

*A. Matching Procedure.* It was possible to locate in the census records 289 or 83 per cent of the deaths included in the sample, 80 per cent of the deaths in February and 86 per cent of the deaths in March. Of the remaining 60 cases, information from the respondents permitted us to classify them as to whether the respondents (a) believed the deceased had been enumerated, (b) believed the deceased had not been enumerated, or (c) did not know if the deceased had been enumerated or not. The results show, roughly, that one-third of the cases fell into each category.

Among the 17 per cent which could not be matched, no single reason could account for a majority of the failures to match. At the outset of the study, it was thought that failure to match in many, if not most, of the cases was due to the omission at the usual home residence of persons who had been in general hospitals at the time of the census; yet, less than one-fourth of the unmatched cases in Memphis fitted this category. In some cases, specific reasons for persons probably having been missed in the census were suggested by respondents' replies. Each of the following reasons accounted for a few cases. The first four are a function of the self-enumeration procedure used. The last four relate to problems associated with old age or illness, that is, of persons near death. However, these reasons account for only about one-third of unmatched cases, mostly those where the respondent knew that the decedent had not been enumerated.

1. Household never received census schedule.
2. Respondent did not have enough space on schedule to include all household members.
3. Respondent listed person but schedule was never mailed.
4. Respondent did not list person because schedule was filled and mailed after the death.
5. Deceased had been living alone and was incapable of filling schedule.
6. Deceased had been moved from one relative to another,



QUESTIONS	NUMBER OF REPLIES POSSIBLE	NUMBER OF REPLIES COMPLETED	PER CENT COMPLETED
What was the last regular address of the decedent?	296	293	99.0
Where was he staying on January 31, 1958?	295	291	98.6
Where was he staying at time of death?	296	291	98.3
Where was the decedent born?	296	285	96.3
Where was his father born?	296	243	82.1
Where was his mother born?	296	240	81.1
What was the highest grade of regular school that the deceased ever attended?	288	233	80.9
When did he last work? (males only)	164	141	86.0
What kind of work did he do in his last job?	162	143	88.3
What kind of business or industry was this work in?	162	147	90.7
What was his usual occupation?	162	128	79.0
What kind of business or industry was this work in?	162	134	82.7
How many children did he (she) ever have?			
Males:	164	152	92.7
Females:	123	107	87.0
Who was head of the household in which the deceased last lived?	296	285	96.3
Where the deceased was <i>not</i> head of household:			
What is the usual occupation of the head?	100	83	83.0
What is the usual industry of the head?	100	77	77.0

Table 2. Per cent of responses completed on each item of returned questionnaires for sample of decedents, Memphis, February-March, 1958.

prior to death, and was not regarded as usual resident of any place.

7. Deceased had planned to move and was, therefore, omitted.

8. Usual address given to hospital was fictitious, so the deceased was not counted either at hospital or outside.

*B. Questionnaire.* Replies were received on 83 per cent of the mail queries sent out for February deaths and 88 per cent for March. The difference arose chiefly through the apparently greater effectiveness of the certified mail follow-up of deaths in March.<sup>3</sup>

The distribution by age, color, and sex of the decedents whose death certificates were used in this study is shown in Table 1, along with the percentage responding in each group. There

<sup>3</sup> Other mail surveys to supplement the information available from the death certificate made by the National Office of Vital Statistics, have shown that the response rate and completion rate can be improved by further specific mail, telephone or direct interview follow-up.

were fewer responses proportionately for nonwhite decedents than for white.

While 85 per cent of the questionnaires sent out were returned, not all the questions were answered. The extent of completed responses is shown in Table 2. The proportion varied from nearly 100 per cent for the question on residence to about 80 per cent for questions on education and occupation.

The questionnaire would be valuable only if it produced the same information that had been obtained in the census enumeration. Replies to the questionnaire were compared with the replies to the census questions, and where the same information was requested, also with the entries on the death certificates.

There was one question that was exactly the same on the three records. This was number 3 on the questionnaire, "Where

Table 3. Correspondence of items reported on different records for sample of decedents, Memphis, February-March, 1958.

ITEM APPEARING ON TWO RECORDS: DEATH CERTIFICATE (dc) QUESTIONNAIRE (q) CENSUS ENUMERATION (c)	NUMBER OF TIMES ITEMS COMPLETED ON BOTH RECORDS	NUMBER OF TIMES REPLIES AGREED	PER CENT CORRE- SPONDENCE
Age in same 5 year age groups (q & c)	250	196	78.4
Birthplace of decedent (dc & q)	295	274	92.9
Birthplace of decedent (dc & c)	194	166	85.6
Last regular address (dc & q)	293	268	91.5
Address as of January 31 (q & c)	237	219	92.4
*Place of death (dc & q)	291	171	58.8
Father's birthplace (c & q)	158	155	98.1
Mother's birthplace (c & q)	147	145	98.6
Highest grade of school completed (c & q)	130	60 }	67.7
Response differed by one year		28 }	
Year last worked (males) (c & q)	78	56	71.8
Last occupation (males) (c & q)	53	45	84.9
Last industry (males) (c & q)	63	53	84.1
Usual occupation (males) (q & dc)	115	79	68.7
Usual industry (males) (q & dc)	109	73	67.0
Usual occupation (dc)—last occupation (q) (males)	129	99	76.7
Usual industry (dc)—last industry (q) (males)	124	98	79.0
Number of children ever born (c & q) (females)	46	37	80.4
Head of household (c & q)	243	206	84.8
Occupation of head of household (not decedent) (c & q)	52	43	82.7
Industry of head of household (not decedent) (c & q)	47	42	89.4

\* Apparently, the wording of this item on the questionnaire was unsatisfactory and was frequently misunderstood.

NOTE: The comparisons of occupation and industry are based on agreement for the 2 digit code used in the current Population Survey of the Bureau of the Census.

was he (she) born?" Out of 194 times that the question on place of birth was answered on all 3 records, the answer agreed in 162 cases. A question on occupation and industry appeared on all 3 records, but the variations in the nature of the question made it possible to compare the records only in pairs.

All comparisons of like responses were made for the group of records on which the question was answered on both. Since not all questions were completed on the census record, the number of comparisons possible were reduced so greatly that the study is not particularly valuable in this respect. The results of the comparisons of questions appearing on different records are shown in Table 3.

#### DISCUSSION

*A. Matched Death-Census Records.* The success of locating an individual in the census records depends obviously on knowing the address at which he was enumerated. In accordance with census practice, each person is enumerated at his usual residence, that is, the place where he lives and sleeps most of the time. The concept of "Usual residence" is also used in completing the death certificate, except for persons dying in resident institutions. For these individuals, the person completing the death record is asked to enter the usual place of residence of the deceased before he entered the institution. Since this address does not serve to locate the census record, separate identification of deaths occurring in resident institutions is needed. It is not possible to know from the death certificate how long the deceased was in the institution, or if he had already been admitted on the day of the enumeration. Thus, it may be necessary to search the enumeration schedule for both the previous residence and the institution in some cases.

There were slightly more cases, proportionately, matched for March than for February, suggesting the existence of an optimum interval after the census date for maximum success in matching death records. Owing to the fact that the census enumeration takes place over a period of time rather than on one day, persons who died during the interval between the

census date and the enumerators' visit may often be omitted from the schedules.

The characteristics of the unmatched cases as shown on the death certificate, when compared with those of matched cases, indicated that there was some selection. A higher proportion of nonwhites, particularly females, were not located in the census record. There was no clear evidence of bias for age or marital status. Apparently, hospitalization at death, or at the time of enumeration, did not affect the chances of matching. The field investigation did not suggest any changes in enumeration procedure that would have improved the rate of matching.

The rate of matched records reached in this study may present a maximum possible because the deaths used in this sample were for urban persons, that is, residents of Memphis who had died in Shelby County. Also, additional information on addresses was obtained from the questionnaire. This is an ideal set of circumstances compared to locating persons who have died in counties or States other than that of their usual place of residence, or who reside in rural areas.

*B. Questionnaire.* The response rate for the questionnaires compared quite well with the experience of other mail surveys. The rate was improved by the use of certified mail.<sup>4</sup>

There is some evidence of bias in the nonresponse group. A higher proportion of nonrespondents was found for nonwhite decedents, with females exceeding males. The completeness of response varied with the type of question. The correspondence of replies to questions on the census schedules and the questionnaire was relatively high for birthplace of the decedent or his parents. It was lower for education and occupation; but these comparisons are scarcely conclusive because they have been made only when replies on both records were completed.

#### PROSPECTS FOR LARGE-SCALE STUDY

The chief problem in a study of characteristics of decedents

<sup>4</sup> This has been observed previously. See Sirken, M. G.: Development of Survey Procedures for Collecting Medical and Social Data for Samples of Recently Deceased Populations. Unpublished paper given at a meeting of the Biometric Society, March 9, 1957.

as described in census records is the number of persons not located in the initial matching process. The pilot study showed that these persons may have been residents of an institution rather than of the address indicated on the death certificate; and that for other persons not located in the census record, it was possible to obtain information about their characteristics in a field follow-up. Thus, a large-scale study of mortality according to characteristics of the decedent as given in the census enumeration record is feasible, if special provision is made to locate persons dying in resident institutions and field or mail follow-up is provided to estimate the characteristics of the unmatched.

A comparable study through questionnaires alone would also require special provisions to obtain complete and accurate responses. In addition, there would still be the problem of having characteristics for the decedent and the base population from different sources.

Prospects for conducting a large-scale study of differential mortality, in conjunction with the 1960 Census, will depend on the creation of a satisfactory research design and on obtaining adequate funds to meet the costs of the study.

# INDUCED ABORTIONS IN JAPAN IN 1953-1954

## A DEMOGRAPHIC ANALYSIS OF REPORTS FROM DESIGNATED PHYSICIANS

MASABUMI KIMURA\*

THE increase in the number of induced abortions in Japan in recent years has raised serious questions among those concerned with maternal health in its physical and social aspects. In order to assess the situation, the Maternal Health Committee of the Imperial Aid Society for Mother and Child cooperated with the Maternal and Child Health Section of the Welfare Ministry of Japan in a survey of the frequency of induced abortions, their characteristics, and the characteristics of the women who had them.<sup>1</sup> Questionnaires were mailed to each of the designated physicians in Japan, with the request that they be filled in and returned to the Committee. A preliminary report on some 5,200 cases has been presented from the health point of view.<sup>2</sup> The present report is based on about 7,000 questionnaires, and the approach is demographic. The

\* From the Department of Public Health Demography of the Institute of Public Health, Welfare Ministry. The generous cooperation of the Maternal Health Committee (Dr. Naotaro Kuji; Dr. Yukio Nakatsu) is deeply appreciated. The author owes a great deal to Dr. Irene B. Taeuber of the Office of Population Research, Princeton University, for critical review of the manuscript, and to Dr. Minoru Muramatsu, the author's colleague, for many suggestions and criticisms, and for permission to use materials from the previous survey.

<sup>1</sup> The Eugenic Protection Law (Law No. 156 of July 13, 1948) had as its major initial purpose the prevention of increase in the descendants of persons with hereditary deficiencies and abnormalities. In the successive modifications the objective of protecting the life and health of the mother became increasingly significant. In the earlier years, it was necessary to apply to a local official committee for authorization to perform an induced abortion for health reasons. This requirement was eliminated in May of 1952. There remain specific legal provisions limiting the persons who are permitted to perform abortions in accord with the law. The physicians who are legally permitted to perform abortions are referred to officially as "designated physicians." In Article 14 of the Eugenic Protection Law, the designated physician is defined as follows: the physician designated for the Law by the Medical Association, which is a corporate juridical body established in the prefectural district as a unit. From the legal point of view, only these designated physicians can perform artificial interruptions of pregnancy, and then only within the restrictions of the law.

<sup>2</sup> Nakatsu, Y., et al.: A Survey of Public Health Aspects of Induced Abortion. *Japanese Journal of Obstetrics and Gynecology*, 1956, 23, No. 1, pp. 27-37. Fifth International Conference on Planned Parenthood. *Report of the Proceedings*. Tokyo, Japan. pp. 234-235.

schedules were handled, coded, and tabulated by a member of the technical staff of the Institute of Public Health of the Welfare Ministry.

Since the survey of the designated physicians was carried out between December of 1953 and about August of 1954,<sup>3</sup> the results may be compared with the reported vital statistics for the calendar year 1954. The summary of vital statistics presented here is intended to define the problem of abortions and show something of its magnitude. As we shall show later, direct comparisons with the reports of the designated physicians to the Welfare Ministry must be made with care.

#### LIVE BIRTHS AND ABORTIONS IN 1954

In Japan in 1954, the 1.1 million registered induced abortions were almost two-thirds as numerous as live births. As the data of Table 1 indicate, more than 91 per cent of all induced abortions were performed prior to the fourth month of gestation. Fetal deaths in the fourth month of gestation and above were about equally divided between induced and spontaneous. All fetal deaths taken together were less than one-fifth as numerous as the induced abortions registered as having been performed prior to the fourth month of gestation.

Table 1. Live births and abortions in Japan, 1954.

VARIABLE	NUMBER	PER 1,000 WOMEN AGED 15-49 <sup>a</sup>
Live Births	1,769,580	77.2
Registered Induced Abortions <sup>b</sup>	1,143,059	49.9
Less than 4 Months Gestation	1,042,910	45.5
Fetal Deaths <sup>c</sup>	187,119	8.2
Induced	99,918	4.4
Spontaneous	87,201	3.8

<sup>a</sup> Japanese nationals only, since reported vital statistics pertain only to them.

<sup>b</sup> Induced abortions performed prior to the seventh month of pregnancy must be reported under the authority of the Eugenic Protection Law.

<sup>c</sup> Fetal deaths are limited to those occurring in the fourth month of gestation or later. An induced fetal death is defined as a fetal death in the fourth month of gestation or later that is due to the induced expulsion of the fetus from the body of the mother. Such induced abortions in the fourth and later months must be reported to the legal authorities according to the Law of the Welfare Ministry.

<sup>3</sup> The survey was terminated in August, 1954 because of lack of funds. Also, some physicians objected to the burden of data collection. Actually, 19.4 per cent of the questionnaires pertain to the year 1953 and 80.6 to the year 1954. Only one case in the records is reported as having occurred in 1955.

In 1954, there were 232,879 live births that occurred with a physician in attendance. This is about 13 per cent of all live births. More than half the spontaneous fetal deaths involved cases in which there was a physician in attendance. All cases involving induced abortions of four months' gestation or more were attended by physicians. Since the registered induced abortions are those reported by designated physicians, it is obvious that these cases involved attendance by physicians. The live births and spontaneous abortions attended by physicians numbered 278 thousand; the induced abortions performed by physicians and reported as such numbered 1.1 million. Since there were 9,597 designated physicians as of August 1, 1954, the average number of reported induced abortions per designated physician was 119.

#### DATA AND BIASES

The questionnaires that were mailed to the designated physicians required detailed records for each abortion performed, including the previous reproductive history of the woman and her statements concerning the reasons why she had the abortion. The survey was carried out from December, 1953 to August, 1954, though some cases were reported after that time. In all, 6,932 questionnaires were returned.<sup>4</sup>

The data that were requested were complex, and the cooperation of the physicians in securing and transmitting the information was voluntary. It is understandable, therefore, that detailed questionnaires were returned for only a small proportion of the total number of abortions performed and reported to the Welfare Ministry. As we have noted, there were almost 96 hundred designated physicians in Japan in the middle of the

<sup>4</sup> The questionnaires were mailed to each of the designated physicians through the prefectural Maternal Health Association, which is the association of the physicians designated by law to perform abortions under the provisions of the Eugenic Protection Law. The prefectural Associations did not report on how they distributed the questionnaires to the physicians in the various prefectures. There was information on the type of institution that returned questionnaires. Approximately 550 designated physicians or institutions returned a total of 6,932 questionnaires. Some 300 individual practitioners sent from two to ten questionnaires each. The cooperating university or municipal hospitals sent 30 to 100 questionnaires each.



year 1954. And, during the period of the survey, about 900 thousand abortions were reported by the designated physicians to the appropriate governmental agency. The total number of questionnaires returned was less than seven thousand. These returns cannot be assumed to be a sample of all abortions performed during the period with reference to geographical location, type of area of residence, type of medical facility used, characteristics of the women, or reproductive histories of the women.

It is understandable, also, that there were divergences in the completeness and consistency with which the information was secured and reported. A classification of the questionnaires by the sole criteria of adequacy of data yielded the following groups:<sup>5</sup>

A. *Adequate*, 4,320 cases. Here the forms were filled in carefully, with full information on previous pregnancies. These adequate reports came from many hospitals and clinics throughout Japan. In order not to bias the materials, the poor questionnaires reported from these clinics and hospitals, where reporting was generally good, were retained in Group A.

B. *Intermediate*, 1,854 cases. These questionnaires were not well filled out, but they did give information on previous abortions. In general, they came from several hospitals in large cities.

C. *Unsatisfactory*, 758 cases. There were 564 of these reports that mentioned only the induced abortion that was performed at the time of survey, or that were compiled erroneously in other ways. Exclusions numbered 148 for women who had remarried, and have pregnancies of previous marriage, and 17 because women were widowed or divorced. Twenty-nine were excluded as reports on spontaneous fetal deaths.

The problems of selection here are intricate ones. Even in the

<sup>5</sup> In the previous report (Nakatsu, Y., *op. cit.*) the material was classified by region and type of medical institution. The regional distribution was as follows: Hokkaido, 39; Tohoku, 468; Kanto, 1,911; Chubu, 757; Hokuriku, 735; Kinki, 704; Chugoku and Shikoku, 93; and Kyushu, 502. The distribution by type of medical institution was as follows: University hospital, 409; municipal hospital, 2,284; private hospital, 552; private clinic, 1,263; and unknown, 701.

hospital records that were prepared most carefully, information was rather poor for women who had frequent abortions or who had large families.

The frequency of abortions of higher orders was greatest in Group C, intermediate in Group B, and least in Group A. There were also systematic differences in the ages of the women.

In the present exploratory analysis, Groups A and B were combined, without weighting. No analysis of the data of Group C is presented here.

The evidence is substantial that there are biases in the questionnaires returned by designated physicians. Such biases are derived from the selectivities among the designated physicians who cooperated with the study through filling out schedules and the selectivities among the abortions that were reported on the inquiry forms. The problem of measurement of the total bias is a difficult one. The major recourse is a comparison of the information on abortions as derived from the survey of 1953-1954 with that derived from the official reports to the Welfare Ministry for the year 1954.

There are many questions about the registration data, for factors of taxation and legal or social acceptability are believed widely to be factors that influence reporting. The percentage age distributions of the women whose induced abortions were reported in the survey differ somewhat from those of the women whose abortions were registered in the year 1954.

AGE	SURVEY, 1953-1954		REGISTRATION, 1954	
	Number	Per Cent	Number	Per Cent
All Ages	6,174	100.0	1,143,059	100.0
Below 20	57	0.9	15,714	1.4
20-24	739	12.0	180,432	15.8
25-29	1,678	27.2	305,362	26.7
30-34	1,685	27.3	299,833	26.2
35-39	1,262	20.4	219,362	19.2
40-44	649	10.5	109,004	9.5
45 or Over	97	1.6	12,315	1.1
Unknown	7	0.0	1,037	0.1

It might be argued that the survey failed to secure complete reporting for younger women, or, perhaps more plausibly, that physicians failed to register higher order abortions to older women. This latter interpretation is reenforced by the distributions of the abortions in the survey and the national registration by the month of gestation in which they were performed.

MONTH	SURVEY, 1953-1954		REGISTRATION, 1954	
	Number	Per Cent	Number	Per Cent
All Months	6,174	100.0	1,143,059	100.0
First	71	1.1	—	0.0
Second	2,068	33.5	528,631	46.2
Third	2,774	44.9	514,279	45.0
Fourth	650	10.5	36,019	3.2
Fifth	166	2.7	31,764	2.8
Sixth	146	2.4	23,162	2.0
Seventh	73	1.2	8,793	0.8
Eighth	23	0.4	—	—
Ninth	6	0.1	—	—
Unknown	197	3.2	411	0.0

There is the further point that the confidential research survey is more likely to secure accurate reporting than the official registration. However, the universe of induced abortions and the characteristics of the women who have them are unknown.

#### THE ABORTIONS OF THE SURVEY PERIOD

The reports of the designated physicians that are analyzed here concern 6,174 women who had induced abortions during the survey period. More than half of these women, 54.5 per cent of the total, were in the central childbearing ages from 25 to 34. Only 12.9 per cent were below age 25, while 12.1 per cent were aged 40 or above. Since 28.4 per cent of live births occur to women below age 25 and 2.3 per cent to women aged 40 or above, induced abortions were proportionately few during the younger childbearing ages, proportionately many during the terminal years of the childbearing period.

Most of the women who had induced abortions were living in marriages of less than ten years' duration. The percentages by duration of marriage were as follows: Less than 5, 23.8; 5 to 9, 29.8; 10 to 14, 23.0; 15 to 19, 13.1; 20 or more, 7.2; and 3.1 unspecified. It is probable that many of those who did not specify marriage duration were young and unmarried. If these unspecified cases are included with the marriages of less than ten years' duration, the percentage of abortions occurring to women whose marriages had lasted ten years or less becomes 56.7.

It is already apparent that relatively few of the abortions terminated pregnancies of very high orders. The percentage distribution of abortions by order of pregnancy was as follows:

ORDER OF PREGNANCY	ABORTIONS	
	Number	Per Cent
Total	6,174	100.0
First	510	8.3
Second	787	12.7
Third	905	14.7
Fourth	1,118	18.1
Fifth	990	16.0
Sixth	741	12.0
Seventh to Ninth	974	15.8
Tenth or Over	149	2.4

The major concentrations were the third, fourth, and fifth pregnancies, with secondary concentrations for the second and the sixth. It is significant that 8.3 per cent of the induced abortions terminated first pregnancies.

The resort to induced abortions by women with relatively few children is also seen in the distribution of the women having abortions reported in the 1953-1954 survey by the number of living children. Some 11 per cent had no living children, while 17.1 per cent had only one child. Almost three-fourths of all the women that had induced abortions had three or fewer children. The precise percentages were as follows: None through three, 72.9; four, five, or six, 23.7; seven or more, 3.5.

The abortion reported in the survey was the first abortion for almost two-thirds of the women, the second for another fourth (Table 2). Only 1.2 per cent of the women reported that this was the fifth or higher order abortion. If the percentages are computed for abortions that followed each other without intervening live births or spontaneous fetal deaths, the percentages in the lower orders are higher. For almost one-third of the women, though, the immediately preceding pregnancy termination had been an induced abortion. More than three per cent of the women had had four or more consecutive pregnancies terminated by induced abortion.

The relation of the abortion to the type of termination of the previous pregnancy suggests both the limited use of abortion and the tendency toward recurrent use of this means of avoiding another child. Some 8.3 per cent of the women were ending a first pregnancy with the induced abortion that was reported, while 55.7 per cent were using abortion after a previous pregnancy that has ended in a full-term live birth. For 4.7 per cent of the women, the previous pregnancy had ended in a fetal death. But almost a third of the women, 31.4 per cent of the total, had also terminated the immediately preceding pregnancy with an induced abortion.<sup>6</sup>

Table 2. Per cent distribution of abortions by order, survey of 1953-1954.

ORDER OF ABORTION	ALL ABORTIONS		CONSECUTIVE ABORTIONS <sup>a</sup>	
	Number	Per Cent	Number	Per Cent
All Orders	6,174	100.0	6,174	100.0
First	3,896	63.1	4,234	68.6
Second	1,515	24.5	1,324	21.5
Third	511	8.3	413	6.7
Fourth	175	2.8	140	2.3
Fifth or Higher	77	1.2	63	1.0

<sup>a</sup> Abortions that follow previous pregnancy terminations by abortion, i.e., without a live birth or a spontaneous fetal death intervening. Thus the 4,234 abortions included as first order in the column for consecutive abortions include the 3,896 first abortions plus 338 abortions of second or higher order that follow live birth or some pregnancy termination other than induced abortion.

<sup>6</sup> The percentage distribution by weeks of gestation at abortion were as follows: 6 or less, 8.0; 7 to 10, 54.5; 11 to 14, 24.6; 15 or more, 9.7; unknown, 3.2.

## THE ORDER OF ABORTION

The previous analysis showed the differences in the characteristics of women and of abortions in the 1953-1954 survey.

In this analysis, the abortions performed during the survey period were differentiated by the order of the abortion reported in the survey. Average values by order and proportionate frequency among all abortions of specified orders are given in Table 3.

Table 3. Changes in characteristics by order of abortion.

CHARACTERISTICS	ORDER OF ABORTION				
	1	2	3	4	5 and Over
AVERAGES <sup>a</sup>					
Age	31.4	32.8	33.9	34.1	36.1
Duration of Marriage	9.1	11.0	11.6	12.5	14.0
Order of Pregnancy	3.8	5.2	6.3	7.6	9.3
Week of Gestation	10.6	9.8	9.7	8.9	9.1
Number of Living Children	2.4	2.8	2.9	3.1	3.1
Time Between Previous and Present Pregnancies <sup>b</sup>					
First Pregnancy	0.9	—	—	—	—
Full Term Birth	2.6	1.6	1.9	0.9	—
Spontaneous Fetal Death	1.7	0.9	1.0	1.5	—
Induced Abortion	—	1.2	1.1	0.8	0.8
TOTAL	2.4	1.2	1.2	0.9	0.8
PER CENT, TOTAL CASES IN ORDER AS 100					
Consecutive Abortions Performed	—	82.1	77.1	76.0	73.9
Women With No Living Children	14.3	6.6	3.8	4.0	2.7
Month of Gestation, Sixth or Over	5.2	2.4	2.6	1.2	1.3
Termination of Previous Pregnancy					
First Pregnancy	13.1	—	—	—	—
Full Term Birth	81.0	14.9	9.4	3.4	—
Spontaneous Fetal Death	5.9	3.0	2.0	2.3	—
Induced Abortion	—	82.1	88.6	94.3	100.0

<sup>a</sup> Arithmetic mean. The numbers of women having abortions of the specified orders were: First, 3,896; second, 1,515; third, 511; fourth, 175; and fifth or over, 77.

<sup>b</sup> In years, by kind of termination of previous pregnancy.

The average age at first abortion was 31.4 years, and there was a progressive increase to an average age of 36.1 at the fifth or higher order of abortion. Average duration of marriage increased similarly with advancing order of abortion.

The mean order of pregnancy was 3.8 for the first abortion, 5.2 for the second, 6.3 for the third, 7.6 for the fourth, and 9.1 for the fifth and higher orders. The intervals between the average number of pregnancies at the successive abortion orders from one through six were 1.4, 1.2, 1.2, 1.2 and 1.1, respectively. These differences in averages should be interpreted cautiously. Since each abortion reported by any woman in the surveyed group was treated as a separate event, the differences between averages do not represent the experience of a group of women all of whom progressed from the lower to the higher order of induced abortion. It may be noted, though, that an average of about 1.2 pregnancies separated the successive average values.

The increase in the average number of living children with successive orders of abortion is far less steep than that in average orders of pregnancy. The association of induced abortion with higher orders of pregnancies would itself operate to reduce the numbers of living children with advancing abortion order.

It should also be noted that the average week of gestation at the time the abortion was performed declined from the first to the fourth abortion.

The interval between the termination of previous pregnancy and the date of the induced abortion declined with the advancing order of the abortion. Average intervals were substantially longer in cases where the previous pregnancy had terminated in a full-term live birth than in those where the previous pregnancy had also ended in fetal death, whether spontaneous or induced. The interval of approximately a year between the termination of a pregnancy in spontaneous or induced abortion and another induced abortion is consistent with the results of medical research on pregnancy rates after induced abortion.<sup>7</sup>

<sup>7</sup> Koya, Y. and Muramatsu, M.: Survey of Health and Demographic Aspects of

(Continued on page 164)

The proportion of pregnancies terminated by induced abortion increased with the order of the pregnancy and the order of the induced abortion. The probability of a consecutive abortion increased with the order of the previous abortion. Consideration of maternal health or other factors may have retarded some women from terminating pregnancies in second or third abortions. However, in 95 per cent or more of the cases, the pregnancies terminated by fourth or higher order abortions followed pregnancies that had also been terminated by abortion. Three-fourths of the women having third or higher order abortions had records of continuous terminations of pregnancies by abortion.

#### ABORTIONS IN THE REPRODUCTIVE HISTORIES

The experiences utilized in the last two analyses were those of the survey period in 1953 and 1954. Many of the women reported previous abortions, however, and so it is possible to contrast the current characteristics of women and abortions with the characteristics at the time of the preceding abortions.

The reproductive histories of the women permit comparable tabulations for the present and the earlier abortions by age, duration of marriage, order of pregnancy, number of living children, and order of gestation (Table 4).<sup>8</sup>

The earlier abortions occurred sometime in the period between 1940 and 1953, the current abortions in the months of the survey in late 1953 and 1954. In most of the characteristics, the differences were small but consistent. It is obvious that age and duration of marriage at the time of the earlier abortions were

Induced Abortion in Japan. Special Report, No. 4. *Bulletin of the Institute of Public Health* 1955, 4, No. 3, p. 1. This report indicates that the median interval between an induced abortion and a pregnancy is 8.0 months less than that between a normal birth and a pregnancy.

<sup>8</sup> All induced abortions reported by the women as having occurred prior to the survey period are included as earlier abortions, without regard to the specific time when the abortions were performed. The various abortions occurring to an individual woman are included as separate cases. This means that each woman having an induced abortion reported as a first abortion is included only in the analysis of current abortions. Each woman having a second or higher order abortion is included not only in the current abortion group but in the earlier abortion group, and she is included in the latter once for each order of abortion below the terminal one that secured her inclusion in the survey.



somewhat lower than in the current abortions. It should be noted, however, that the current abortions occurred at lesser average months of gestation than the earlier ones.

It is in the relation of induced abortions to fertility that the

Table 4. The characteristics of women and abortions, current and earlier abortions reported by women in the 1953-1954 survey.

CHARACTERISTIC AT TIME OF ABORTION	ORDER OF ABORTION				
	1	2	3	4	5 and Over
	NUMBER OF WOMEN				
Current Abortions	3,896	1,515	511	175	77
Earlier Abortions	2,278	763	252	77	47
	AVERAGES				
Age of Women					
At Earlier Abortion	31.1	32.0	33.2	34.2	32.5
At Current Abortion	31.4	32.8	33.9	34.1	36.1
Duration of Marriage					
At Earlier Abortion	9.1	10.2	11.5	12.3	10.6
At Current Abortion	9.1	11.0	11.6	12.5	14.0
Order of Pregnancy					
Earlier Abortion	4.0	5.2	6.5	7.6	8.6
Current Abortion	3.8	5.2	6.3	7.6	9.3
Month of Gestation					
Earlier Abortion	2.9	2.7	2.6	2.7	2.4
Current Abortion	2.7	2.4	2.4	2.2	2.3
Number of Living Children					
At Earlier Abortion	2.6	2.9	3.1	3.1	2.6
At Current Abortion	2.4	2.8	2.9	3.1	3.1
	PER CENT, TOTAL CASES IN ORDER AS 100				
Women With No Living Children					
At Time of Earlier Abortion	9.3	5.2	4.4	3.9	2.1
At Time of Current Abortion	14.3	6.6	3.8	4.0	2.7
Month of Gestation, Sixth or Over					
Earlier Abortion	4.5	2.3	2.3	3.0	—
Current Abortion	5.2	2.4	2.6	1.2	1.3

major differences appear. The average number of living children was greater at each order of abortion in the earlier than in the current series. The per cent of the women having abortions who reported no living children was substantially greater for first order abortions in the current series than in the earlier series.

#### REASONS FOR ABORTIONS AS GIVEN BY THE WOMEN

The reasons why women have induced abortions involve complex social and psychological motivations. The reasons involved in the decision and the reasons reported immediately prior to the performance of the operation may differ. In a general questionnaire, it was possible to list only some objective conditions or factors and to ask the woman to circle the one or more that was applicable. The reasons as offered included those specified in the Eugenic Protection Law. They also included such things as the lack of desire for a child, difficulties in the economy of the home or in housing, illness or disease on the part of wife or husband, fear of poor heredity, conception while single or legally unmarried, and conception under conditions of force.

About 28 per cent of the women checked duplicate reasons. In these cases, the most frequent combinations were "no desire for child," "ill health," and "economic difficulties in home." After an analysis of these duplicate entries, uniform rules for the determination of a single reason were adopted. In general, priority was given to the more specific independent reason.<sup>9</sup>

The numbers and percentage distributions of reasons given for the abortions reported in the 1953-1954 survey were as given on the next page.

The reasons given for having abortions changed as the orders of the abortions increased. Induced abortions that were procured because another child was not wanted increased with the order of the abortion. The giving of the illness specified in the

<sup>9</sup> There was a formal allocation of priorities among joint reasons. Priority was given to the more independent factors. This means that fairly low priorities were assigned to health and economic reasons.

<i>Reason</i>	<i>Number</i>	<i>Per Cent</i>
All Abortions	6,174	100.0
Did Not Want Child	371	9.0
Too Many Children	1,416	22.9
Last Child Too Young	888	14.4
Economic Difficulty	773	12.5
Housing Difficulty	96	1.6
Hyperemesis	754	12.2
Tuberculosis, All Forms	383	6.2
Sickness, Eugenic Law	411	6.6
Other Specific Disease	315	5.1
Sickness of Husband	101	1.6
Protection, Maternal Health	250	4.1
Hereditary Disease	16	0.3
Not Yet Married	129	2.1
Conception by Force	8	0.1
Special	181	2.9
Unspecified	82	1.3

Eugenic Protection Law and the justification on the basis of the protection of the health of the mother decreased as the order of the abortion increased.

An analysis of the "special reasons" for women giving them for first abortions indicates the multiplicity of the occurrences that lead women to seek abortions.<sup>10</sup> In the 99 cases analyzed, there was a major predominance of family problems. "Family troubles" were reported by 23, the desire to plan family size by 15. Troubles with other children were frequent, for 15 women mentioned children who were crippled or suffering from severe disease. In 13 cases, the family union was being broken. Four women had just been widowed. Ten reported that they had been seriously ill. Seven said that they feared childbirth. Nine were professional prostitutes. Three wanted to terminate a first pregnancy at an advanced age.

Major differences in reasons or in the selection of reasons

<sup>10</sup> The 99 cases analyzed here are all from the Group A schedule, while only 24 cases in Group B reported special reasons.

characterized the women of various ages and with varying sizes of families (Tables 5 and 6). Younger women and those with small families used such reasons as the following: The last child is too young; the woman is not yet married; tuberculosis; an ill husband; and hyperemesia according to the Eugenic Law. In more than 90 per cent of the cases, the illness of the husband was tuberculosis.

Most of those reporting themselves as not yet married were cases in which there was a *de facto* marriage that had not been registered. However, some cases were the results of temporary affairs.

Those who gave economic and housing difficulties, other unspecified reasons, and protection of mother's health were about average in age and in family size. Those giving the types of special reasons noted earlier had smaller numbers of living children than the average for women of the same age. Since

Table 5. Average age of women and average weeks of gestation at abortion, by reason and order of abortion.

REASONS FOR ABORTION	AVERAGE AGE OF WOMAN			AVERAGE WEEKS OF GESTATION		
	First	Second	Third and Fourth	First	Second	Third and Fourth
Did Not Want Child	33.1	33.5	33.6	10.1	8.9	10.0
Too Many Children	37.3	37.1	36.7	10.1	9.6	8.9
Last Child Too Young	26.2	28.3	28.9	11.0	9.7	9.2
Economic Difficulty	31.1	32.2	33.3	10.8	9.8	9.7
Housing Difficulty	29.0	32.0	33.1	10.2	9.8	7.7
Hyperemesia	30.4	31.4	32.4	9.4	9.4	9.1
Tuberculosis, All Forms	29.3	28.7	31.7	11.2	10.9	9.7
Sickness, Eugenic Law	31.0	32.8	33.7	13.0	10.1	11.5
Other Specific Disease	32.6	32.9	35.4	11.5	10.7	11.2
Sickness of Husband	30.8	31.2	30.0	10.8	9.6	10.4
Protection, Maternal Health	33.0	31.9	32.8	10.2	9.0	9.4
Hereditary Disease	29.0	—	—	18.4	—	—
Not Yet Married	22.8	25.3	—	13.2	12.4	—
Conception by Force	22.5	—	—	9.9	—	—
Special	29.8	32.3	33.8	11.7	10.2	9.2
Unspecified	31.2	30.9	32.5	10.0	9.4	8.2
TOTAL	31.4	32.8	34.0	10.6	9.8	9.5

women who claimed protection of mother's health as a reason included women suffering from chronic diseases, the average number of living children was small compared with the average for all women of the same age.

The lack of desire for a child and the diseases of the Eugenic Protection Law were alike used by older women. Here family size is above the average. The reason called "lack of desire for a child" is a weighted mixture of those who report that they have too many children and those who say that the last child is too young. This reason has a pattern similar to that of the protection of the health of the mother. Heart disease, beri-beri, acute or chronic nephritis, the anemias, and similar illnesses are among the diseases commonly mentioned in relation to the Eugenic Protection Law. The women giving these reasons

Table 6. Average number of living children by order of abortion and type of termination of previous pregnancy, by reason.

REASONS FOR ABORTION	AVERAGE NUMBER OF LIVING CHILDREN			TERMINATION OF PREVIOUS PREGNANCY PER CENT			
	First Abortion	Second Abortion	Third and Fourth Abortions	First Abortion <sup>a</sup>		Second Abortion <sup>b</sup>	
				First Pregnancy	Live Birth	Live Birth	Induced Abortion
Did Not Want Child	2.8	2.6	2.6	6.0	90.4	12.5	87.5
Too Many Children	4.4	4.3	3.9	—	93.8	12.1	82.6
Last Child Too Young	1.8	2.0	2.2	—	98.6	43.4	56.6
Economic Difficulty	2.2	2.5	2.7	16.3	76.7	11.1	87.1
Housing Difficulty	1.9	2.6	3.1	33.3	59.7	13.3	73.3
Hyperemesis	2.0	2.3	2.3	17.9	74.8	12.7	85.5
Tuberculosis, All Forms	1.4	1.4	1.9	26.9	67.3	8.9	85.6
Sickness, Eugenic Law	2.1	2.6	2.6	17.2	74.5	14.3	83.7
Other Specific Disease	2.3	2.5	2.4	10.2	79.6	4.8	95.2
Sickness of Husband	2.0	2.3	1.8	9.7	83.9	8.7	87.0
Protection, Maternal Health	2.3	2.2	1.6	7.4	82.8	13.6	86.4
Hereditary Disease	0.5	—	—	50.0	40.0	—	—
Not Yet Married	0.0	0.2	—	98.1	0.9	5.0	95.0
Conception by Force	0	—	—	100.0	0.0	—	—
Special	1.4	2.3	2.5	37.1	54.3	14.5	78.2
Unspecified	2.1	2.4	3.3	11.1	82.2	32.0	68.0
TOTAL	2.4	2.8	3.0	13.1	81.0	14.9	82.1

<sup>a</sup> These columns concern the immediately preceding pregnancy of women whose first induced abortion was included in the 1953-1954 survey.

<sup>b</sup> These columns concern the immediately preceding pregnancy of women whose second induced abortion was included in the 1953-1954 survey.

carried their pregnancies to higher months of gestation prior to induced abortion.

The statement that children were already excessive was used by older women. As would be expected, the average size of family was already large.

The women who had induced abortions for first pregnancies offered housing difficulties and tuberculosis as reasons, in addition to various special reasons. Such reasons as "not yet married," "conceived through assault," or "fear of heredity" were used primarily by those who were terminating first pregnancies in induced abortion. When the abortion was a second one, other reasons predominated, including the statement that the previous child was too young, tuberculosis, other diseases, and the illness of the husband.

In an earlier field study, Dr. Koya and his collaborators reported the reasons for induced abortions among the women included in their study.<sup>11</sup> Their conclusion was that the underlying reasons for not wanting more children, as for wishing to postpone having another child, were economic. Although it was usually not possible to assess the seriousness of the health reasons given by the women in the course of the interviews, it was believed that most of the reasons were valid.

The percentage distribution by major groups of reasons in the study by Dr. Koya and his collaborators was as follows:<sup>12</sup>

<i>Reason</i>	<i>Percentage</i>
Principally Health	17.1
Primarily for Spacing	16.6
Mainly Economic	50.5
Primarily Lack of Desire for More Children	13.3
Other	2.5

The present writer retabulated the material from the earlier

<sup>11</sup> Koya, Y., et al: Preliminary Report of a Survey of Health and Demographic Aspects of Induced Abortion in Japan. *Archives of the Population Association of Japan*, 1953, No. 2, pp. 3-5. Also *A Survey of Induced Abortion in Japan and Its Significance*. *Milbank Memorial Fund Quarterly*, July, 1954, XXXII, No. 3, pp. 282-293.

<sup>12</sup> Koya, Y., and Muramatsu, M.: *op. cit.* This tabulation refers only to the first abortion that the woman had.

study of Dr. Koya and his colleagues according to the codes used in this survey. The results are given in Table 7. Dr. Koya's study secured information on abortions performed from August, 1949 to July, 1950. It is natural, therefore, that the women were older and the families larger than those of the present survey. These factors may account for the greater predominance of health reasons in Dr. Koya's study than in ours. The striking thing, though, is the general similarity of reasons in the two surveys.

It seems that perhaps 15 to 20 per cent of induced abortions are desired principally for health reasons. Economic reasons are direct principal reasons only in about 15 per cent of the cases. Child spacing is a major factor in about 15 per cent of the cases.

The fact remains that Dr. Koya's interviewers believed that economic factors were predominant in more than half of the cases. Dr. Sutter's analysis of induced abortions in a district of Paris may help to clarify the situation.<sup>13</sup> Dr. Sutter found that economic and psychological motivations were combined in 51 per cent of the cases, whereas only 11 per cent were for economic reasons only. It may be possible to interpret the emphasis on the priority of economic difficulties by Dr. Koya and his colleagues in a similar way, that is, that motivations were interlocked. The classification rule that we used selected out only what seemed to be pure economic reasons.

#### CONCLUSIONS

Questionnaires mailed to designated physicians and returned by them provided reproductive histories of 6,174 women who had an induced abortion in the survey period, the majority of them between December, 1953, and August, 1954. Although there are biases in region, type of institution, and perhaps in type of case reported, the data are more detailed and probably more representative than those of the official registration reports.

Abortion was not an aberrant phenomenon, for most of the

<sup>13</sup> Sutter, J.: Results d'une enquête sur l'avortement dans la région parisienne. *Population* 1950, 5, No. 1, pp. 77-102.

Table 7. Reasons for induced abortions by order, reports of designated physicians and Dr. Koya's study. Per cent distributions.

REASONS	ORDER OF INDUCED ABORTION <sup>a</sup>					
	First		Second		Third and Fourth	
	Dr. Koya's Study	Designated Physicians	Dr. Koya's Study	Designated Physicians	Dr. Koya's Study	Designated Physicians
Spacing	18	18	15	10	9	7
Too Many Children	27	25	29	32	41	43
Economic Difficulty	14	13	24	17	12	15
Health	23	17	20	17	17	15
Special	3	3	3	4	7	3
Other Reasons <sup>b</sup>	15	24	9	19	14	16
Unspecified	—	1	—	2	—	2
TOTAL	100	100	100	100	100	100

<sup>a</sup> This tabulation includes the first to the fourth abortions in the reports of the designated physicians (this study), and all induced abortions in Dr. Koya's study.<sup>b</sup> Other combinations of reasons in Dr. Koya's study, and other reasons in our material. They both exclude special reasons stated explicitly by the woman.



women terminating pregnancies in this way in 1953 and 1954 were in the central childbearing years from 25 to 34 and in the first decade of their marriages. Most pregnancies were third to fifth, though one-fifth were first or second pregnancies. Almost two-thirds of the induced abortions were first order, while another one-fourth were second order. There were women who had repetitive abortions reported, but only 12 per cent of all abortions reported in the 1953-1954 survey were third or higher orders. However, in more than nine-tenths of the cases, the pregnancies terminated by fourth or higher order abortions followed pregnancies that had also been terminated by abortions.

Separate analysis of the current and the earlier abortions of the women in the survey showed general similarities in the characteristics of the women at the successive abortion orders and in the characteristics of the abortions in relation to the terminations of previous pregnancies.

The influence of the recent rapid diffusion of contraception on abortion is suggested by the fact that the average number of living children was greater at each order of abortion for the earlier abortions.

The reasons given by the women varied with age, marital status, previous pregnancy record, and previous abortion experience. Reasons were interrelated, and no one was predominant. Health factors and economic difficulties were each predominant in about a sixth of the cases. A combination of the various reasons that said essentially that another child was not wanted accounted for about half the reasons given by the women having abortions in the 1953-1954 survey.

Comparisons with earlier studies by Dr. Koya and his associates corroborate the evidence from the present study that psychological and economic factors are related rather than alternative reasons.

# ANNOTATIONS

## SOCIAL CLASS, MENTAL ILLNESS, AND AMERICAN PSYCHIATRY<sup>1</sup>

AN EXPOSITORY REVIEW<sup>2</sup>

S. M. MILLER<sup>3</sup> AND ELLIOT G. MISHLER<sup>4</sup>

THIS book may well have a marked effect upon the future practice of psychiatry. It reports the results of a major investigation by a sociologist-psychiatrist team of the relationships between social class and the appearance and treatment of mental illness. Fragmentary findings had been made available before (twenty-five articles have appeared over the last five years), but a great deal of important material is presented here for the first time and the authors have expanded their forthright interpretations of the study's implications for the treatment of the mentally ill.

The excitement of a pioneering study arises from the freshness of its point of view and the provocativeness of its findings. It poses new questions and places old ones in a new light. This quality of exciting discovery is present in the important and sometimes startling findings of this study. We can give some indication of the significance of the book by quoting

<sup>1</sup> Hollingshead, August B. and Redlich, Frederick C.: *SOCIAL CLASS AND MENTAL ILLNESS*. New York, John Wiley & Sons, 1958, 442 pp., \$7.50.

<sup>2</sup> A number of persons commented on earlier versions of this paper. In particular, the exposition has benefitted from the detailed comments of Ernest M. Gruenberg, M.D., Matthew Huxley, and Frank Riessman. Only the authors, of course, bear responsibility for the final formulations presented in this paper.

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the three major hypotheses which are the central concerns of the investigation:

(I) The prevalence of treated mental illness is related significantly to an individual's position in the class structure. (II) The types of diagnosed psychiatric disorders are connected significantly to the class structure. (III) The kind of psychiatric treatment administered by psychiatrists is associated with the patient's position in the class structure.

A major problem of such ground-breaking investigations is that the core discovery overwhelms both authors and readers alike by the brute fact of its existence. In the first wave of response there is often a neglect of fundamental questions concerning the approach, the methodology, and the interpretations placed upon the data. The chapter summaries tend to enter without qualifications into the folklore of the discipline.

The potential importance of this book for theory, research, and practice in the mental illness field is too great to permit such neglect.

#### I. EXPOSITION OF FINDINGS

A. *The Social Class Structure.* The basic data on social class composition is derived from interviews with respondents in a 5 per cent sample of all households in the metropolitan area of New Haven, Connecticut, which had a total population of about 236,940 persons. The New Haven population is divided into five social classes arranged in a hierarchal order. The family's class position is determined by the score of the head of the family on a weighted "Index of Social Position" that is derived from three separate scales measuring the social rank of his (a) area of residence; (b) occupation; and (c) education. The weights used in the formula for computing the summary index and the cutting points used to distinguish between classes were decided on specifically for this study and are not extrapolation from theory or other research. Roughly, occupation receives almost as much wieght as the other two scores combined.

Class I, or the *upper class*, constitutes about 3 per cent of the population. It is composed of both "old" and "new" fam-

ilies who live in the most exclusive residential areas; the family head is a college graduate who is either an executive of a large firm or a professional. Class II, the *upper middle class*, is 8.4 per cent of the population and is made up occupationally of the managerial and professional groups. In Class III, the *lower middle class*, who make up 20.4 per cent of the population, about half are in salaried white collar work and the remainder either own small businesses, are semi-professionals, foremen, or skilled workers.

Class IV, the *working class*, is the largest group and accounts for half the households (49.8 per cent). Half of the group is semi-skilled workers, a third is skilled, and about a tenth is white collar employees. The overall educational level is much lower than in the class above it.

The *lower class*, Class V, which is 18.4 per cent of the population of New Haven, is made up of unskilled and semi-skilled workers of low education.

A rich and detailed description is provided of the historical background of the social class structure and of certain cultural characteristics of each of the classes such as their religious, family, ethnic, and leisure time patterns.

B. *The Prevalence of Persons in Psychiatric Treatment*. A "Psychiatric Census" was carried out in which an attempt was made to enumerate all persons from the New Haven metropolitan area who were "in treatment with a psychiatrist or under the care of a psychiatric clinic or mental hospital between May 31 and December 1, 1950."

The procedure here was remarkably thorough: systematic inquiries were made of relevant facilities and practitioners in New England and New York City and to special facilities further afield. The investigators' persistence brought response from every hospital and clinic contact and from 70 per cent of the private practitioners. In all, they believe that they may have missed only about 2 per cent of the community's residents who were receiving treatment. A total of 1,891 cases was enumerated on whom there was sufficient data for analysis. The data thus only permit discussion of *treated* mental illness, not of the total amount of mental illness in the community. To study the latter, a different type of research design with

a psychiatric interview or some similar device of a cross-section of the community would be necessary. Thus, in the Hollingshead-Redlich study, there would have had to have been a

(Table A.) Class status and the distribution of patients and nonpatients in the population.

CLASS	POPULATION, %	
	Patients	Nonpatients
I	1.0	3.0
II	7.0	8.4
III	13.7	20.4
IV	40.1	49.8
V	38.2	18.4
	<i>n</i> = 1891	236,940
	$\chi^2 = 509.81, 4 \text{ df}, p < .001$	

SOURCE: Hollingshead, A. B., & Redlich, E. C.: *Social Class and Mental Illness*, Table 8, p. 199.

illness. As can be seen in Table A, classes I through IV are somewhat underrepresented in the patient population, while Class V, to which 38 per cent of the patient group are assigned by their scores on the Index of Social Position, is greatly overrepresented with twice as many patients as might be expected on the basis of their number in the community. Significant differences are also found in a comparison of treated prevalence rates per 100,000 population (computed so as to adjust for age and sex differences among the classes) which are distributed as follows:

(Table B.) Class status and rate of (treated) psychosis per 100,000 population (age and sex adjusted).

CLASS	ADJUSTED RATE PER 100,000
I-II	523
III	528
IV	665
V	1,668
Total Population	808

SOURCE: Text Table p. 210.

psychiatric study of all of the individuals included in the 5 per cent sample of New Haven to enable statements to be made about "true" incidence and prevalence.

The major finding—one of the study's core discoveries—is of a systematic relationship between social class and the treated prevalence of mental

In a more detailed analysis, Hollingshead and Redlich divide the patient group into specific diagnostic categories. A first glance reveals that the differences among the classes in treated prevalence rates are much greater for psychoses

DIAGNOSTIC CATEGORY OF NEUROSIS	CLASS			
	I-II	III	IV	V
Antisocial and Immaturity Reactions	21	32	23	37
Phobic-Anxiety Reactions	16	18	30	16
Character Neuroses	36	23	13	16
Depressive Reactions	12	12	10	8
Psychosomatic Reactions	7	9	13	11
Obsessive-Compulsive Reactions	7	5	5	0
Hysterical Reactions	1	1	6	12
	<i>n</i> = 98	119	182	65
$\chi^2 = 53.62, df 18, p < .001$				

Source: Table 13, p. 226.

(Table C.) Percentage of patients in each diagnostic category of [treated] neurosis—by class (age and sex adjusted).

than for neuroses. The proportions of patients diagnosed as psychotic increase as one moves from Class I-II through Class V and conversely the proportions diagnosed as neurotic decrease (this reversal of the first relationship is automatic inasmuch as the two general categories make up the whole of the patient group). However, since this is a tempting finding to cite, it is important to point out that the authors discount its general importance and attribute it as possibly arising from the "differential use of psychiatric facilities by the population."

There are interesting differences among the social classes in regard to the specific neurotic disturbance which is modal among those who are in treatment: In Classes I and II the modal disturbance is character neuroses; in III and V, anti-social and immaturity reactions; while phobic-anxiety reactions are frequent in Class IV. Each of the above accounts for about one-third of the neurotic patients in each class as can be seen in Table C.

With regard to specific types of psychoses, much less variation in their percentage importance is found than is the case with the neuroses, as Table D reveals. In particular, for some of the major categories, differences are essentially non-existent—schizophrenia is the predominant psychotic disorder in all classes and the proportions of all psychotics who are schizo-

DIAGNOSTIC CATEGORY OF PSYCHOSIS	CLASS			
	I-II	III	IV	V
Affective Psychoses	21	14	14	7
Psychoses resulting from Alcoholism and Drug Addiction	8	10	4	8
Organic Psychoses	5	8	9	16
Schizophrenic Psychoses	55	57	61	58
Senile Psychoses	11	11	12	11
$n = 53$	142	584	672	
$\chi^2 = 48.23, df\ 12, p < .001$				

SOURCE: Table 14, p. 228.

(Table D.) Percentage of patients in each diagnostic category of [treated] psychosis—by class (age and sex adjusted).

phrenic run from a low of 55 per cent in Class I to 61 per cent in Class IV. This finding is striking since earlier studies have reported a much higher rate of schizophrenia in Class IV and V neighborhoods than in other neighborhoods. Little variation exists among the classes in diagnoses of senile psychoses (11 or 12 per cent in each). Class V is disproportionately low in the affective psychoses with 7 per cent, and the other classes give figures of 14 or 21 per cent. Organic psychoses are highest in Class V (16 per cent) and lowest in Class I (5 per cent),

(Table E.) Class status and the rate of different types of [treated] psychoses per 100,000 of population (age and sex adjusted).

TYPE OF DISORDER	CLASS			
	I-II	III	IV	V
Affective Psychoses*	40	41	68	105
Psychoses Due to Alcoholism and Drug Addiction†	15	29	32	116
Organic Psychoses‡	9	24	46	254
Schizophrenic Psychoses§	111	168	300	895
Senile Psychoses	21	32	60	175
$n = 53$	142	585	672	

\*  $\chi^2 = 17.49, 3\ df, p < .001$ .

†  $\chi^2 = 77.14, 3\ df, p < .001$ .

‡  $\chi^2 = 231.87, 3\ df, p < .001$ .

§  $\chi^2 = 452.68, 3\ df, p < .001$ .

||  $\chi^2 = 88.36, 3\ df, p < .001$ .

SOURCE: Table 15, p. 232.

and Class IV with 4 per cent has half the rate of the other classes for psychoses resulting from alcoholism and drug addiction.

The treated prevalence rates for all of the separate neuroses (except hysterical reactions) show statistically significant differences among the classes. However, there is no ordering from a higher to a lower class that is consistent from one diagnostic category to another. The pattern of each neurosis with class must be examined and interpreted separately, as the authors do. Table E on the rates of persons in psychiatric treatment for different types of psychoses by class is the clearest demonstration in the book of an ordered inverse relationship of the type of disorder under treatment and social class. Although the curves for each disorder (affective, organic, schizophrenic, etc.) vary, in *every* case there is an increase in the rates as one moves from Class I-II to Class III, to Class IV, to Class V.

C. *The Incidence of Mental Illness.* One of the most important tools of epidemiological research and analysis is the distinction between *incidence*, i.e., the occurrence of new cases during some specified time, and *prevalence*, i.e., the total number of active cases in the population during some specified time. Although incidence is one of the components in a total prevalence picture, there is no systematic relation between the two since cases may be active currently that first appeared at any point in the past. In other words, as is generally known, prevalence rates do not directly reflect incidence rates since the former are dependent on rates of recovery and mortality from illness as well as on the occurring of illness.

All the figures reported above, and those in previous articles based on the study are for the prevalence of being in treatment. The most important new material in the volume is the presentation of incidence data for the psychiatric sample. It was derived by separating-out patients who entered or re-entered treatment during the interval of observation from those who had been in treatment at the beginning of the interval. It should be emphasized again that both incidence and prevalence rates refer to individuals *in treatment* rather to individuals with a mental disorder whether or not they are



in treatment. Consequently, the appropriate definition of incidence data for this investigation might be the numbers or rate of those first coming into treatment and prevalence might

(Table F.) Class status and rate of incidence of [treated] neurosis and psychosis per 100,000 population (age and sex adjusted).

CLASS	RATE
I-II	97
III	114
IV	89
V	139
Total	104

$\chi^2 = 8.41, 3 \text{ df}, p < .05$

SOURCE: Text Table p. 212.

cally significant but the differentials are markedly reduced in comparison with the prevalence rates. Class IV now has the lowest rate. The authors summarize by stating: "Classes I and II contribute almost exactly the number of new cases (incidence) as could be expected on the basis of their proportion of the community's population. Class IV had a lower number than could be expected proportionately, whereas Class V had an excess of 36 per cent," (p. 215). In further analyses, Hollingshead and Redlich demonstrate that there is *no* significant statistical difference among the classes in the rate at which persons come under treatment for neuroses and show that the sharpest break in this rate for psychoses as a whole and for schizophrenia (both cases where the overall differences among classes are statistically significant) occurs between Classes IV and V with very little difference appearing among the rates for Classes I through IV (pp. 235-6). (We shall return at a later point to these important findings regarding incidence.)

The data on incidence and prevalence reveal that Classes IV and V comprise two-thirds of the community (68.2 per cent) and provide more than three-fourths (78.3 per cent) of the mental patients. Thus, due to the size of these two classes, the high psychotic incidence rates in Class V, and the long duration of illnesses in both classes, *psychiatry—whether or not it*

be stated as the numbers or rate of those in treatment during the study period.

The rates of coming into treatment for all kinds of mental illness are reported in Table F.

The table shows that the overall differences remain statistically

is aware of it—is largely concerned with Class IV and V patients. Of course, private practitioners have few Class IV and V patients, but our calculations of the Hollingshead-Redlich data show that these two sources of treatment work with only 21 per cent of all New Haven mental patients.

*D. Paths to Treatment.* In an excellent discussion of the paths to psychiatric treatment, the authors make explicit their fundamental orientation that mental illness is a socio-cultural phenomenon as well as a psychological one. Thus, they state “. . . abnormal acts can be evaluated only in terms of their cultural and psychosocial contexts,” and “Whether abnormal behavior is judged to be disturbed, delinquent, or merely idiosyncratic depends upon who sees it and how he appraises what he sees.”

The sources of referral for treatment, i.e., the agencies or persons who decide that the behavior is that “type” of abnormality for which psychiatric treatment is appropriate, vary systematically by social class. Among neurotics, 55 to 60 per cent of those in Classes I through IV are likely to have been referred by physicians (almost entirely by private practitioners in the first three classes, and about half the time in Class IV by clinic physicians). The proportion of neurotic cases coming from medical referrals drops to 40 per cent in Class V; an equivalent proportion is referred by social agencies; with an additional 14 per cent directed to treatment by the police and courts (p. 186).

The differences are even more striking among psychotics where one-third of the patients in Class I were self-referrals and another 40 per cent came through family and friends. More than three-fifths of the Class III and IV patients were referred by physicians. For Class IV psychotics the police and courts are important, accounting for 19 per cent of the cases, and in Class V these two sources account for 52 per cent while social agencies contribute 20 per cent. The findings for schizophrenia are similar to those for psychosis in general (pp. 187–189).

The brief case reports that are presented to illustrate the different treatment consequences that follow on the same behavior when exhibited by persons of different classes should

be required reading in all psychiatric residency programs. The authors note that "there is a definite tendency to induce disturbed persons in Classes I and II to see a psychiatrist in more gentle and 'insightful' ways than is the practice in Class IV and especially in Class V, where direct, authoritative, compulsory, and at times, coercively brutal methods are used."

And, their bitter, concluding epigram to this section is uncomfortably appropriate to their findings: "The goddess of justice may be blind, but she smells differences, and particularly class differences."

E. *Patterns of Treatment*. At the end of their chapter on the Treatment Process, Hollingshead and Redlich state that "the data presented lead to the conclusion that treatment for mental illness depends not only on medical and psychological considerations, but also on powerful social variables to which psychiatrists have so far given little attention," and that "We have found real differences in *where, how, and how long* persons in the several classes have been cared for by psychiatrists."

These conclusions are based on a large number of detailed analyses of relations among diagnosis, treatment agency, treatment, and social class. We shall cite only a few of the more decisive findings.

First, the patient group as a whole divides into three relatively equal parts according to the principal type of therapy received; psychotherapies, organic therapies, or custodial care. Eighty-four per cent of the psychotic group is in treatment in a state mental hospital; 64 per cent of the neurotics are in the hands of private practitioners and another 23 per cent are being treated in clinics.<sup>5</sup>

Despite the stress placed on diagnosis in psychiatric theory and practice, there is no overall relationship for neurotic patients between type of treatment and the specific diagnostic label attached to the patient. However, treatment is related directly to both social class and the agency in which the patient is treated. Even where treatment is received from the same facility, which is the most stringent test since it eliminates the selective bias that is present in the differential access to and

<sup>5</sup> Calculating the data in terms of the psychiatric agency involved, reveals some important practices: 30 per cent of the patients treated by private practitioners and by public clinics are suffering from various types of psychotic disorders.

choice of facilities by the different classes, there is a marked relationship between social class and type of treatment. For example, over 85 per cent of the Class IV and V neurotics in treatment with private practitioner receive "directive psychotherapy," while 45 per cent of Class I and II private patients receive "psychoanalysis or analytic psychotherapy." Consistent with this is the inverse relationship between social class and the likelihood of receiving the traditional "50 minute hour." (Ninety-four per cent in Classes I and II, 45 per cent in Class V, Tables 28, and 29, pp. 268-70).

A similar relationship between the "depth" and duration of the therapy and social class is also found in clinics, and there is additional evidence in a separate study of one clinic that the "patient's class status determines the professional level of the therapist who treats him." Public hospitals appear to be more democratic in their assignment of treatment to neurotic patients, inasmuch as there is no overall relationship between social class and treatment in these institutions.

The findings with regard to class bias in the type of treatment given to psychotic patients and to schizophrenics are less clear and less consistent than for the neurotic group. On the other hand, the relations of class to the duration and history of treatment are very significant and very revealing. For example, as one moves down the class ladder, the likelihood for schizophrenics of having been in continuous treatment increases, while moving in the other direction there is an increased likelihood of periods of remission and re-entry into treatment. In other words, once he enters treatment the Class V schizophrenic is likely to be kept under psychiatric care (Table 38, p. 295). Further, for psychotics there is a direct increase from Class I to Class V in the time duration of their present course of treatment; while for a neurotic this relationship is reversed. In other words, while the lower class neurotic is dismissed from treatment much more quickly than patients from higher classes, the lower class psychotic is rarely perceived as "ready" to leave treatment.

In comparing patients of Classes III-V who have been admitted to the hospital for the first time with patients of the same classes who have been hospitalized previously, a striking

finding emerges: The new patient is more likely to receive custodial care than the longer time patient! The implication is that patients of these classes are not given custodial care because of the failure of other methods but are somewhat routinely assigned to this very limited care. In Class V, for example, 64 per cent of the patients who are receiving custodial care had not had any previous treatment.

No discussion of treatment is complete that omits mention of expenditures and fees. The chapter dealing with this material contains more detailed comparative information than is available in any other source. One of the most salient findings is that the mean cost per day in private hospitals is higher for Class IV patients than for patients in the higher classes (\$31.11 to \$23.76 for a Class I person). This result which is contrary to expectation results from the discriminatory discounts granted higher status persons. Further, the higher status persons receive the most expensive therapies which leads the authors to state: "To use a metaphor, private hospitals are designed for the 'carriage trade' but they are supported by the 'shock box.'" A similar relationship is found in clinics where treatment expenditures per patient are strongly related to class status, with the result that "Class II patients receive the most therapy and Class V patients the least." This finding is particularly disturbing since the clinics have presumably been developed to serve the psychiatric needs of lower status persons.

F. *Recommendations.* In a thoughtful and interpretive summary of the implications of their findings for the problem of the mentally ill in our society, Hollingshead and Redlich point to the gap between the extent of the need and the resources currently available to meet it. While they give proper emphasis to the financial problem (what America needs is a "good five-dollar psychotherapist"), they also point to the difficulties that result from the differences in cultural values and role expectations between psychiatrists and patients from the lower social classes. They note that psychiatrists tend to come from the upper and middle classes and have outlooks which lead many of them to dislike Class IV and V patients and to disapprove of the behavior patterns of Class V individuals.

More than money will be needed. Among the possible partial solutions to the problems that they suggest are proposals that psychiatrists themselves be trained to recognize and deal squarely with the differences between themselves and patients from other classes; that new forms and modes of therapy be developed to reach the "difficult" patients (whose difficulty seems to reflect the difference between his and his therapist's class positions more than his psychological disturbance); and, that new non-medical therapists, whose education would be less expensive than psychiatrists', be trained to treat the emotional disorders which do not have medical problems associated with them.

## II. DISCUSSION OF FINDINGS

This detailed and complex study touches on a large number of important issues concerning the social context of mental illness and its treatment. It represents a distinct step forward in a number of ways.

Three features of the study are especially notable: (a) The presentation of incidence figures as well as prevalence data is strongly to be commended. (b) The method of estimating the social class of patients and the community, despite the limitations indicated below, is an improvement over those employed in previous studies which tended to assume that all who lived in a particular area or paid a similar rent were in the same class. (c) Social class is linked to many more facets of mental illness than just the rate and kind of mental illnesses; in particular, the link of class to the treatment process is innovative.

In our discussion we have restricted ourselves to and organized our comments around three topics that are critical for the study: the concepts of social class and mental illness; the validation of the basic hypotheses; and, the implications of the study for psychiatric treatment.

*A. Concepts of Social Class and Mental Illness.* Among sociologists, there is a variety of approaches to the problem of social stratification. Hollingshead and Redlich view the different classes as differently primarily in their "styles of life" and use their combined scores on education, occupation, and

residence as rough indices of these five different sub-cultures rather than as variables that are important in their own right.

In a study that directs explicit attention to the problems of getting "to" treatment and getting something "out of" treatment, the use of a combined index is unfortunate since it precludes analyses that might help to clarify what is involved in these processes. For example, it would have been of particular interest to be able to examine the relationships of education to the prevalence and treatment data in order to determine if an increase in education is associated with an increase in the propensity to view one's problems in psychological terms and therefore to benefit from psychological modes of treatment. Such a possibility is suggested by results in recent surveys of attitudes toward mental illness.<sup>6</sup> Enough evidence also exists to indicate that educational differences among individuals of the same occupational level are associated with differences in other characteristics, such as attitudes on public issues, so as to make the possibility of such cross-breaks especially desirable.<sup>7</sup>

In the Hollingshead system, some wage-earners are Class IV, others III or V, while white-collar workers are either III or IV. The class groupings thus become overlaps of various kinds, reducing their homogeneity, confusing comparisons and making generalizations difficult. An anomaly is that 18 per cent of New Haven was assigned to Class V in a time of prosperity. This figure seems high even with New Haven's migrant labor situation and may be due to a conceptualization of Class V which leads to a broad category characterized by widely varying behavior; for example, regular but unskilled workmen are lumped together with irregular but semi-skilled workmen.

Occupation scores correlate .88 with the original criterion on which the weighted index was based, and correlate less highly than this with residence and education (.50 and .72 respectively, p. 394). From this, it would appear that little would have been lost if occupation alone were used as the index

<sup>6</sup> See relevant findings in the forthcoming National Opinion Research Center study directed by Shirley Star; *PEOPLE'S ATTITUDES CONCERNING MENTAL HEALTH*. New York: Elmo Roper, 1950; and Elaine and John Cumming, *CLOSED RANKS*. Cambridge: Harvard University Press, 1957.

<sup>7</sup> Stouffer, Samuel: *COMMUNISM, CONFORMITY AND CIVIL LIBERTIES*. New York: Doubleday, 1955. Riessman, Frank: "Workers' Attitudes Toward Participation and Leadership," unpublished doctoral dissertation, Columbia University, 1955.



of social class. On the other hand, much might have been gained by this procedure since, in addition to permitting potentially revealing analyses, it would have reduced the heterogeneity of the social class groups allowing for more precise interpretations of the results. (If the data for occupation, education, and area of residence have been separately recorded by the researchers, it would be a comparatively simple procedure to see what variations by education exist within levels of occupations as classified, for example, by the Bureau of the Census. Such additional "runs" of the data would extend their usefulness, especially by permitting comparisons with other investigations.)

The importance of the study's findings, and our confidence in them, rests in large part on the fundamental assumption that the two basic variables of social class and mental illness have been measured independently of each other—if not, then the found relationships must be viewed skeptically as possibly spurious. This seems an easy enough assumption to accept. However, the findings in a recent study<sup>\*</sup> raise serious doubts as to its validity. In this exceptionally well-controlled study, Haase is able to demonstrate that the same set of presenting symptoms is diagnosed as more severe when the patient is perceived by subtle cues to be a working class person than when he is seen as in the middle class. In the Hollingshead-Redlich study, despite the safeguards, this bias might be reflected in such findings as the relatively higher rates of psychoses as compared to neuroses when one moves down the class hierarchy, and would directly affect the relative sizes of the populations coming into treatment as well as the prevalence rates of persons in treatment for the different classes. One such study, of course, is insufficient grounds for rejecting the findings presented here. The issue, however, is of such crucial importance that the final acceptance of the findings must rest on further investigations of the relationship of class to the diagnostic process itself.

<sup>\*</sup> Haase, William: "Rorschach Diagnosis, Socio-Economic Class, and Examiner Bias," unpublished Ph.D. dissertation, New York University, 1956. For a general discussion of diagnostic tests and social class, see Riessman, Frank and Miller, S. M.: Social Class and Projective Tests. *Journal of Projective Tests*, December, 1958, 22, pp. 432-439.



B. *The Validation of Hypotheses.* Compared to most investigations of complicated areas in social science, this book is a model of clarity with regard to the presentation of its guiding hypotheses and the procedures by which these hypotheses were tested empirically. The assumptions behind each decision in the development of the research design are stated explicitly and the basic instruments are described with sufficient detail so as to permit other researchers to replicate the study with exactitude.

This report is organized around three hypotheses that were formulated explicitly and tested directly. (Findings on two other hypotheses dealing with social mobility and the relation of class to developmental factors in psychiatric disorders will be reported in the forthcoming companion volume by J. K. Myers and B. H. Roberts, *SOCIAL CLASS, FAMILY DYNAMICS, AND MENTAL ILLNESS.*) Briefly, the hypotheses, which we have quoted earlier, state that the social class structure is related to the treated prevalence of mental illness, the specific types of diagnosed psychiatric disorders, and the types of treatment administered by psychiatrists to patients. The authors conclude that their findings confirm these hypotheses, and we have reported the relevant findings in our expository section above. At this point, we shall re-examine their interpretations of some of the critical tables.

One of the major faults in the authors' approach to their findings is found in the first direct comparison that they present between the proportions of patients and the proportions of persons in the community in each of the five social classes (see Table A). Only *one* class, Class V, has disproportionately more patients than its frequency in the population, and *all* the other classes have less patients than would be expected. (If the data in this table are re-computed with the omission of Class V, the Chi Square test—the statistic used to evaluate all of the major findings—remains statistically significant but is markedly reduced in size, and the disproportionate contribution of Class IV is only 4 per cent more than expected, and of Class III, 3 per cent less than expected.)

While at various points they note that the major difference is between Classes IV and V, they include in their summary of

this table the statement that "The lower the class, the greater proportion of patients in the population." The same interpretive tendency is found in their discussion of class differences in adjusted rates of mental illness (p. 210) where they ignore the fact that the Class III rate is actually *lower* than the rate in Class I-II. Again, in commenting on the class differences in incidence rates, they state (p. 212) "In a word, class status is linked to the incidence of treated mental illness." (The rates are shown in Table F.) A re-computation of these data, omitting Class V, reveals Class III and *not* Class IV as having a higher than expected number of patients.

Basing their remarks on the data we have just reviewed, Hollingshead and Redlich conclude their chapter by stating "... enable us to conclude that Hypothesis I is true. Stated in different terms, a distinct inverse relationship does exist between social class and mental illness. The linkage . . . follows a characteristic pattern; Class V, almost invariably, contributes many more patients than its proportion of the population warrants. Among the higher classes there is a more proportionate relationship. . ." (p. 217).

What we are attempting to point out by this close review of their data is that the authors' tendency to report that there is a consistent and ordered inverse relationship between social class and mental illness is simply not an accurate interpretation of their findings. It would have been, as a matter of fact, more consistent with their "styles of life" view of social classes to have stressed what we believe is the major finding, namely the consistent differences between Class V and the other classes, with the differences that exist among the latter not clearly and consistently patterned in a hierarchal fashion.

Our attention was first called to this problem by the comments and remarks of other professionals and students who were summarizing the book's findings in seminars and staff meetings by statements like "The lower the class the higher the rates of mental illness." The general tendency in discussions of class differences to group together Classes I-II versus Classes IV and V is another contributor to the misinterpretation of their findings. The book is so notable for its clarity in other respects that it is unfortunate that the interpretive sum-

maries lend themselves so easily to confusion and distortion. (It might also be mentioned that synoptic statements of the order—"The lower the class the higher the rates of mental illness"—ignore the nature of the Hollingshead-Redlich data which are of treated illnesses not total illnesses. The relation between treated and total illnesses in different social classes is not known and the total rates cannot be assumed to be a standard coefficient of the treated rates.)

In interpreting the relationships between class and specific types of neurosis and psychosis (Hypothesis II) there is a tendency to use an overall significant statistic to report differences for specific disorders when the latter are less systematic and depend on rather small numbers of cases. For example, their two basic tables (Tables C and D) demonstrate that overall, there are statistically significant associations of the five classes with the seven specific neuroses and with the five specific psychoses. They then refer to an "extreme concentration" of hysterical patients in Class V. Examination reveals there are only eight Class V patients in this category and the reduction of the cell by two or three cases would erase its percentage difference from Class IV. Again, they state, "The higher the class, the larger the proportion of patients who are affective psychotics," yet a reduction of three cases among those in Classes I-II would completely eliminate the differences from Class I through Class IV, leaving only Class V as different from the others.

So far, except for one illustration, we have been concerned in our discussion with the reports and interpretations of prevalence data which permit specific tests of the authors' explicit hypotheses and form the major substantive findings around which the book is organized. We have already remarked on the important distinction between prevalence and incidence and will turn now to the findings on the incidence of specific disorders.

Hollingshead and Redlich separately compute rates for each of the "components" of prevalence: new cases arising during their six months interval of observation (incidence), cases that re-entered treatment during that period (re-entry), and those that had been in treatment at the beginning of the period (con-

tinuous). They then proceed to test for significant differences among the classes for each of these rates, separately for neuroses and psychoses. (See data presented in Table G. We consider them to be the most important findings in the book on social class and mental illness.)

They find significant differences among the classes for each of the component rates *except* for the incidence of neurosis. In other words, there is no systematic relationship between social class and the rates of coming into treatment for neurosis.

It appeared to us that the statistical significance of the other relationships of class and incidence rates (both new and old cases) might depend almost entirely on Class V. We re-computed incidence and re-entry rates for neuroses and psychoses, omitting Class V from the calculations. The test showed *no* significant differences among Classes I through IV. (Chi Square for the incidence and re-entry of neuroses are

(Table G.) Incidence, re-entry, continuous, and prevalence rates per 100,000 for [treated] neuroses and psychoses—by class (sex and age adjusted).

NEUROSES				
Class	Incidence	Re-entry	Continuous	Prevalence
I-II	69	44	251	349
III	78	30	137	250
IV	52	17	82	114
V	66	35	65	97
$\chi^2 =$	4.40	8.64	69.01	56.05
df	3	3	3	3
p	> .05	< .05	< .001	< .001

PSYCHOSES				
Class	Incidence	Re-entry	Continuous	Prevalence
I-II	28	44	117	188
III	36	38	217	291
IV	37	42	439	518
V	73	88	1344	1505
$\chi^2 =$	12.37	15.73	748.47	741.09
df	3	3	3	3
p	< .01	< .01	< .001	< .001

SOURCE: Table 16, p. 235.

1.96 and 3.36; for psychoses, the figures are .28 and .08. None of these is significant at the .05 criterion value.)

To summarize these findings: there are *no* significant differences among social classes I-V in the incidence of new cases of neuroses. There are *no* significant differences among classes I through IV in the incidence of new *or* old cases of neuroses *or* psychoses. Class V has significantly different and higher rates of new and old cases of psychosis (and the inclusion of Class V in the computations suggests that Class IV has a *lower* rate of re-entry of neurotics than the other classes).

The contrast between the significant differences in prevalence and the findings we have just reported of non-significant differences in incidence is extremely important. By concentrating on the prevalence data, an important finding for sociologists and psychiatrists—that Class IV has the lowest overall mental illness rate—is ignored, and some traditional views about the incidence of mental illness are left untouched. There is an implication at many points throughout the book that the prevalence findings may be interpreted as class differences in the likelihood of developing various mental illnesses (the descriptions of class sub-cultures in Chapters 3 and 4, and the discussions of social class and the life cycle in Chapter 12 are presumably given an important place in the book because treated prevalence data are to some extent thought of in these terms). It is also likely that the findings will be discussed in both the lay and professional literature to some extent as if the prevalence findings did bear on questions of etiology.

Perhaps a recent statement on this by Dr. Redlich himself may serve to minimize such a tendency. "The New Haven study has not really brought out anything which is of etiological significance in explaining differences in prevalence, and prevalence in itself is not a very good measure from an epidemiological viewpoint. . . We found, as far as the accumulation of schizophrenics in the lower classes is concerned, that although not entirely, it is mostly due to the fact that the lower socioeconomic groups get different treatment and have different opportunities for rehabilitation."<sup>9</sup> It is unfortunate that this

<sup>9</sup> SYMPOSIUM ON PREVENTIVE AND SOCIAL PSYCHIATRY, April 15-17, 1957. Walter Reed Army Institute of Research, Washington, USGPO, 1958. (p. 199).

position was not stated as clearly in the book under review. In addition to these restrictions on the interpretation of the prevalence findings, and the fact that the data deal only with *treated* prevalence, our re-examination of the incidence data also supports the conclusion that the etiological significance of social classes for mental illness is yet to be demonstrated.

When the spurious issue of etiology is brushed aside, the book's major findings stand out quite clearly and they are of extreme importance. Essentially, these refer to the differential psychiatric treatment given to patients of different classes with the apparent result of an accumulation of cases in the lower classes. Besides the differences between the distributions of incidence and prevalence rates that we have discussed there are other findings that bear on this. The differences among classes on the paths to treatment, the types of treatment received, and the costs of treatment are important contributions to the understanding of the social aspects of medicine.

It should be noted that in many respects the study is an important followup of the Committee on Costs of Medical Care more than two decades ago.<sup>10</sup> By carefully studying how many and what kinds of persons are in psychiatric treatment, the nature and place of treatment, how much medical time is spent with them and the costs of treatment, a baseline is provided for discussion of the most effective social utilization of psychiatric manpower and resources. Coupled with other data, the present study provides an opportunity to define the "psychiatrically indigent" category—undoubtedly a much more inclusive category than that of the "medically indigent."

The authors' conclusions regarding class bias in treatment do not depend on the other findings and do not suffer from the weaknesses of method and interpretation that we have discussed above. They are to be commended for their courage in facing this important issue squarely and for their no less coura-

<sup>10</sup> See the report by Lee, Roger I. and Jones, Lewis Webster: *THE FUNDAMENTALS OF GOOD MEDICAL CARE*. Chicago: University of Chicago Press, 1933. They quote Dr. Olin West that "... the outstanding problem before the medical profession today is that involved in the delivery of adequate, scientific medical service to all the people, rich and poor, at a cost which can be reasonably met by them in their respective stations in life." "Adequate medical care" is defined in both quantitative and qualitative terms: "... a sufficient quantity of good medical care to supply the needs of the people according to the standards of good current practice." (p. 3).

geous attempt to meet the problem by a forthright presentation of a number of proposals that are decidedly controversial in American psychiatric practice.

C. *Implications of the Study.* In view of the preceding discussion, we shall not take space to discuss the important theoretical issues about the relationship of social factors to the etiology of mental illness.<sup>11</sup> Rather, we shall restrict our remarks in this section to the study's implications for psychiatric practice.

It has been well known before this that the needs of the population for psychiatric treatment were not being met adequately. What this investigation demonstrates beyond this, is that the distribution of available resources is socially discriminatory. We believe that a serious moral question is also involved in this discovery, since the psychiatric profession legitimates its claim to high status and to social and economic rewards on the grounds that it functions in a "universalistic" nondiscriminatory way. Actually, it operates in such a way as to restrict its "best" treatments to persons in the upper social classes.

We agree that the need requires the development of new modes of treatment, better understanding by psychiatrists of social class patterns and their reactions to them, and new types of non-medical therapists. We wish, however, to point to some of the assumptions involved in these recommendations and raise some questions that deserve further consideration. First, the authors appear to assume that psychoanalysis or some form of analytic psychotherapy is always ideally preferable to a directive or organic mode of treatment, and that therefore Class IV and V patients are being short-changed. At one level this is a value question since the different therapies are associated with different therapeutic goals, and the issues of what goals to select and who is to decide upon them lie in the realm of value. At another level, this is an empirical issue of whether other forms of treatment might not actually be more effective, rather

<sup>11</sup> Nor shall we discuss a problem that we have alluded to several times—how representative the census of patients is of all of the mentally ill people in New Haven, especially in regard to the social class distribution of the total. Since individuals of different classes come to clinic and other treatment through different routes, it may not be assumed that the census sampled to the same degree the actual amount of all mental disorders in the different social classes.



than simply less costly and less demanding for certain groups of patients. Definitive empirical evidence does not yet exist to provide an answer to this question.

There also seems to be the assumption that it is the psychiatrist who relatively completely controls the type of treatment given. It may be that patients search out psychiatrists who will give them their preferred type of treatment and reject non-preferred treatments, both from private practitioners and within the clinics and hospitals. The selective process and pressures emanating from the patient cannot be ignored in a full account of the biased pattern of psychiatric treatment.

This leads to a related point. There is a tendency to discuss the problem of therapy with working class and lower class persons in a way that implies that the therapist wishes to give the patient "more" than the patient wishes. For example, some practitioners assert that the therapist wants to help the patient come to his own decisions, but the patient only wants to be told what to do; the therapist wants to establish a long term relationship with the patient, but the patient wants a quick remedy; the therapist wants deep and lasting changes, but the patient is satisfied with superficial and transient results. The alternatives may be multiplied beyond this, but what is important is that they seem to imply a rejection of the therapist and the therapeutic process by the patient. We should like to suggest that quite the opposite may be happening. Rather than asking for "less" than he is offered, the working class and lower class patient may actually be asking for "more" in the sense that he wants a fuller, more extensive, and more permanent relationship than is possible either within the traditional definition of the therapeutic relationship or in terms of what the therapist wishes to enter into. In other words, it may be the therapist who drives the patient from treatment because he cannot handle the demands placed upon him, rather than the patient who drops treatment because its demands are too much for him.<sup>12</sup> (With the knowledge we have of working class and

<sup>12</sup> Some evidence exists that many patients of other classes may have similar sets of expectations and present similar problems to psychiatrists. In a by-product of the study under review, it has been found that Class III and V patients exhibit strong resemblances in their expectations of therapy. Our hypothesis would be that it is the low-educated members of Class III who especially exhibit "non-psychiatric"

(Continued on page 197)



ethnic cultures it is difficult to subscribe without qualification to assertions that patients from these groups do not like to talk or have special difficulties entering into relationships. The basic questions are: What kind of relationships, with whom, and under what conditions? In raising these questions we are suggesting that some prevailing interpretations of working class and lower class life may have to be re-evaluated.)

### III. RESEARCH PERSPECTIVES IN SOCIAL PSYCHIATRY

Perhaps nothing emerges more clearly from the book viewed as a whole than the need for continued systematic research on the relationships of social factors to mental illness and psychiatric practice. Our critical comments on the Hollingshead-Redlich study have included suggestions as to how future studies of a similar nature might be improved. We should like at this point to note briefly some additional areas and questions for research that have been suggested by both the achievements and shortcomings of this work.

A. *The Etiology and Epidemiology of Mental Disorders.* The etiological significance of social variables such as social class for various mental disorders remains an open question. Clearly, studies of "true" incidence will be needed before we are able to suggest answers to this question. In design these studies will have to be comparative and longitudinal and they will have to permit the isolation and control of different and changing forms of psychiatric practice. Field investigations of "true" prevalence such as the "Midtown" and "Stirling County" studies, reports from which are now in preparation, will provide a beginning for understanding the relationships between such data and those for treated prevalence as reported by Hollingshead and Redlich. It is to be hoped that future investigations, in addition to including alternative indices of social class, will also be concerned with the effects of other social factors such as, for example, community and family structure, and ethnicity.<sup>13</sup>

attitudes. Redlich, F. C., Hollingshead, A. B., and Bellis, E.: Social Class Differences in Attitudes Towards Psychiatry. *American Journal of Orthopsychiatry*, January, 1955, 25, pp. 60-70.

<sup>13</sup> For an illustration of the relation of one aspect of community structure, namely, multiple- vs. single-family dwelling units, to cerebral arteriosclerosis and senile psychosis, see, New York State Department of Mental Hygiene, *FOURTH ANNUAL*

(Continued on page 198)

More attention will have to be paid to the general problems of psychiatric diagnosis and classification. The nomenclature of the clinic is not particularly useful for field studies, but conceptual links must be forged among the different typologies and indices that are being developed. In all of this work it will be of particular importance not to neglect the fact that the process of psychodiagnosis is inherently a social process and full understanding requires the perspectives of sociological theory and analysis. In addition to data on types of disorders, the extension of a public health approach to the control of mental illness will require information on the severity and the extent of disability associated with mental illness so that large-scale social programs in the prevention, termination, or reduction of such disabilities may be undertaken.<sup>14</sup>

*B. Patterns of Psychiatric Treatment.* The findings presented by Hollingshead and Redlich on the different paths to treatment followed by patients from different classes are very important, and this is an area in which we need to know much more. The history of the illness before the point of referral, the factors that enter into seeking help at a particular stage, the relation of time and type of referral to outcome, and the relationships of all of these to social class require exploration in further studies.

What variables and processes are involved in the initial phase of treatment that seems to be such an important determinant of later outcomes? How much choice is available to the patient and how does he exercise his choice? How does the process of class discrimination in assignment and treatment operate in clinics and other treatment facilities? How are the goals of treatment set and how are these goals related to the different values of patients and therapists and to their images of and attitudes toward each other?

The list of important research questions may be expanded

REPORT OF THE NEW YORK STATE HEALTH COMMISSION, 1954, pp. 31-33; on the impact of ethnic variations in family structure, see, Barabee, Paul and von Mering, Otto: Ethnic Variations in Mental Stress in Families with Psychotic Children. *Social Problems*, October, 1953, 1, pp. 48-53; and Singer, J. L. and Opler, M. K.: Contrasting Patterns of Fantasy and Motility in Irish and Italian Schizophrenics. *Journal of Abnormal and Social Psychology*, July, 1956, 53, pp. 42-47.

<sup>14</sup> Gruenberg, Ernest M.: Application of Control Methods to Mental Illness. *American Journal of Public Health*, August, 1957, 47, pp. 944-952.

easily. We wish to end with a special plea for evaluative studies of the effects of various forms of psychiatric treatment. There is a desperate shortage of systematic evidence in this area, and without such evidence our decisions regarding proper treatment tend to be determined by current fashions in psychiatry or by implicit social values and assumptions.

Although we have been critical of some of the methods and interpretations we should like to stress our respect and admiration for this fascinating and exciting study. It is a book of considerable significance that focuses our attention on a range of important problems which had barely been discussed before. We regard it as a study of psychiatric practice rather than as one of epidemiology, and consider it a great contribution to the study of treatment. If it is not the definitive study that hopefully may be made in the next decade or two, that study will, in part, be possible because of the pioneering work of Hollingshead and Redlich.

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## BRITISH CHILDREN UNDER FIVE

SINCE 1946 the children born in Great Britain during the first week of March of that year have been the subjects for observations on a number of aspects of child growth and development. By biennial home interviews with the mothers, examination of hospital records, and measurement of the child, information has been assembled relating to the children's growth, illnesses, training, family's use of community services, home conditions, and similar topics. The observations when the children were two and four years of age have been summarized in the report, *CHILDREN UNDER FIVE*.<sup>1</sup>

The major classification of the child population in the presentation of the data is that of social group, based on the father's occupation at the beginning of the survey in 1946. Seven groups are defined: professional and salaried, black coated (white collar), skilled, semi-skilled, unskilled, agricultural, and

<sup>1</sup> Douglas, J. W. B., and Blomfield, J. M.: *CHILDREN UNDER FIVE*. London, George Allen and Unwin Ltd., 1958, 177 pp. 21s.

self-employed. Though not explicitly stated, this order is treated as a descending scale, if the agricultural and self-employed groups are excluded. The first two groups are referred to as "non-manual workers," and the rest, except for the self-employed, as "manual workers." Two other classifications of the families are often used: a rating of standard of maternal care based on the health visitor's evaluation and a rating of the housing of the family as indicated by the existence of overcrowding (more than 1.5 persons per room) and the lack of a kitchen, bathroom, or running hot water.

The original cohort of births numbered 13,687 and was reduced to 12,930 by the exclusion of multiple and illegitimate births. For the survey, all children of professional and "black coated" families were included plus a 25 per cent sample of the children in the other five social groups, resulting in a survey population of 5,386. Losses due to death, emigration, inability to trace the family, or refusal of the interview reduced this number to 4,742 in 1948 and 4,668 in 1950. There was some excess of losses to the study in the two higher social groups, but the possible bias resulting from this appears minor.

The topic to which most attention is devoted is that of illness among the children. Mortality during the first year of life was inversely related to social group. These differences under one month of age were attributable to differences in prematurity rates, while between one month and one year, they were due primarily to a higher mortality from pneumonia and gastroenteritis in the children in the lower social groups. Mortality at the ages 1 to 5 was much the same in all groups. Respiratory infections were more frequent in children of the non-agricultural manual workers than among children in the other social groups. In families of non-manual workers the occurrence of respiratory infections in infants appeared to be inversely associated with the quality of both maternal care and housing. Infectious disease rates did not seem to be influenced by either social group, overcrowding, or level of maternal care. The only difference among social groups with respect to infectious diseases was a tendency for children of the manual workers to contract them at a younger age than did the other children. Accident rates among infants showed a small but significant

increase with declining economic level of the families, but after one year of age there were no consistent differences by social group. Accidents were correlated to a limited degree with the adequacy of maternal care, but no association was found between accidents and housing conditions. Hospital admissions for infants were also related inversely to social class, but this was not observed for the older children. Most of this group difference for infants was due to hospitalization for infectious diseases since the poorer families were evidently less able to provide proper home care for their babies with these diseases.

The children's growth is discussed only in terms of their height since the weight measurements in many instances were unsatisfactory. Average height at both 2 and 4 years of age decreased with declining social level and these group differences were more pronounced at 4 than at 2 years of age. In the groups in the middle of the social scale, children's height varied with the standard of maternal care, but this was not found for children in the classes at either end of the scale. The authors surmise that "below a certain level even the best manager cannot provide an adequate diet for her child with the money available. . ."

Seven hundred and seven children out of the total cohort of 12,930 single, legitimate infants were classified as premature on the basis of a birth weight of 5.5 lbs. or less. This group was subject to higher mortality at all ages than were the full-term infants, and up to two years of age spent more time in the hospital. The average height of the prematures was less than the mean for the non-premature children at both 2 and 4 years of age. However, the differences at 4 years between the two groups are said to reflect differences in the heights of their mothers.

Because of the discussion in recent years of the emotional effect upon the child of separation from the mother, information on this topic was collected when the children were 6 years old. Fourteen per cent of the children had at some time been separated from their mothers for a continuous period of four weeks or more; some had stayed in the home during this period, while others had been away from the family. The children in the latter group exhibited a greater amount of emotional diffi-

culties as indicated by nightmares, nail biting, etc., than did the non-separated children. Those children who experienced maternal separation but were at home during the separation did not show these differences from the non-separated group, and this was true also of children from broken homes, who in most instances remained with the mother, or of children of working mothers.

The remaining portions of this report are concerned with topics which are less amenable to adequate summarization, such as the use of community services, working mothers, and toilet training.

This survey had its origins in a study of the use of maternity services and the cost of childbearing, and no longitudinal investigation was contemplated. The committee in charge of the work is to be commended for recognizing and taking advantage of the opportunity provided by the original study to maintain a large group of children under long-term observation with minimum chances for losses from the study population.

RICHARD V. KASius

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#### POPULATION GROWTH AND ECONOMIC DEVELOPMENT IN LOW-INCOME COUNTRIES: A CASE STUDY OF INDIA'S PROSPECTS<sup>1</sup>

THIS is a unique and valuable book. For the first time, competent scholars have made a comprehensive survey of the effects of alternative rates of population growth on the economic development of low-income countries. Densely populated India is intensively studied; then the results are tested for countries not plagued by population density, by applying them to Mexico. The work combines solid empirical research with analytical competence in demography and economics.

Part One is introductory. In Part Two the authors forecast population growth in India during the thirty-year period 1956-1986, on two alternative assumptions concerning the trend in

<sup>1</sup> Ansley J. Coale and Edgar M. Hoover: *POPULATION GROWTH AND ECONOMIC DEVELOPMENT IN LOW-INCOME COUNTRIES: A CASE STUDY OF INDIA'S PROSPECTS*. Princeton, New Jersey, Princeton University Press, 1958.

birth rates. They have little doubt concerning the prospective trend in death rates; they will fall significantly. In Part Three they discuss the economic factors which will affect the rate of growth in India's national output, and in Part Four they analyze all of the major interrelations between the rate of growth in population and that in national output. Then they demonstrate that their major conclusions hold in sparsely settled countries as well as in India.

Citation of a few of their facts and findings will indicate the scope of their work. Official Indian estimates of birth and death rates are almost certainly in error. In 1956, the birth rate was about 42.8 and the death rate 25.6. While death rates will drop steadily, in the absence of a massive national campaign, birth rates will not fall during the next thirty years. If not, the population growth rate will exceed two per cent per year by 1961, and will exceed 2.5 per cent in the 1980's, and between 1956 and 1986 the population will more than double—from 384 million in 1956 to 775 million in 1986. If fertility rates fall steadily to half their 1956 rate by 1986, the rise in population will be 53 per cent.

Even if food production is doubled between 1956 and 1981 (by which time the population will have risen by 78 per cent) in the absence of birth control measures, it will not be sufficient to meet the demand for food at even a very gradual rise in per capita income. Before 1981, India will have to export manufactures to pay for food imports. The "capital-output ratio" is not apt to exceed 3:1 in the near future, and is not apt to rise above 3.5:1 later.

The climax of the analysis is the conclusion that not only will per capita income be materially higher in 1981 with the lower rate of population increase than with the higher; total national output will also be higher. For with the higher rate of population increase, a larger share of income must be spent for consumption, a larger share of the reduced flow of investment must be spent for welfare facilities, and workers will be less well trained and fed. Two considerations favorable to the higher rate of population increase are not recognized: with a faster increase in population and the labor force each unit of capital will yield a somewhat higher output because more workers will



be available to work with it, and less mistakes in investment are likely because a larger share of investment will be duplication of the old. But these factors certainly will not weigh heavily, especially since the differences in growth in the labor force will not be great. The differential population increase will be largely in the younger ages. The Hoover-Coale conclusions are not affected by this refinement.

These selected statements do not indicate the scope of the topics covered, which is broad. The style is bland, rather than sparkling. But it is clear. Both persons interested in economic growth and those interested in demography will find the book of value.

E. E. HAGEN

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### SIMPLE METHODS OF CONTRACEPTION<sup>1</sup>

IN October, 1957, the Planned Parenthood Federation of America brought together in New York some thirty medical investigators and "students of human behavior and values" for a full day's symposium on the results of some current tests of simple contraceptive methods and their implications. The essence of the proceedings has now been published in a small book of attractive format for distribution to groups and individuals whose professional fields are related to the subject matter. The cover letter sent with complimentary copies to doctors calls it "the most comprehensive work available in the field. . ." The table of contents indicates that the symposium certainly covered a lot of ground; the size of the volume indicates that the reader will get but a fleeting view of that ground. What was said at the symposium is compressed into less than fifty uncrowded printed pages.

Part I deals with The Emerging Variety of Effective Methods. Three progress reports on clinical tests of simple vaginal

<sup>1</sup> SIMPLE METHODS OF CONTRACEPTION: AN ASSESSMENT OF THEIR MEDICAL, MORAL AND SOCIAL IMPLICATIONS, edited by Winfield Best and Frederick S. Jaffe, with a Foreword by R. Gordon Douglas, President of the American College of Obstetricians and Gynecologists, New York, Planned Parenthood Federation of America, 1958. 64 pp., no price given.



inserts (a foaming vaginal tablet, and cream or gel alone) and a report on the test of an oral contraceptive in Puerto Rico take only three to five pages each, including statistical tables and footnotes which incorporate data on effectiveness in two of the tests during the 6 months after the meeting. All tests were begun in 1953 or later and are still continuing.<sup>2</sup> The medical evaluation of these tests in group discussion covers the next eleven pages.

Part II, contrary to the broad promise of the book's subtitle, is a discussion of the potential impact of these simple contraceptives on *American* life, in 4 parts: the outlook for the family (5 pp.), the question of distribution (3 pp.), cultural changes and moral values (6 pp.), and the need for education in responsible family living (6 pp.). A bibliography of thirty-seven selected articles on contraceptive research and clinical testing since 1949 gives "references to many of the most important contraceptive studies of the last decade." The articles are mainly in medical journals, but a few are papers delivered at recent International Planned Parenthood Conferences and articles in science periodicals. There are very few references to basic research in physiology and endocrinology, and none on moral and social implications of contraception.

The preliminary results of the four research projects may be summarized very briefly. Simple chemical contraceptives (spermicides) such as a foaming vaginal tablet, and gel, cream, or jelly without diaphragm seem to show considerable promise of effectiveness when used by well-motivated persons after intensive education in the particular technique selected (Los Angeles Planned Parenthood Clinic study), but are rather ineffective when used by poorly-motivated persons of low socio-economic status (Sinai Hospital Contraceptive Clinic, Baltimore study). Compared with the more conventional method of diaphragm plus jelly or cream, the simple methods appear very slightly more effective (Mt. Sinai Hospital, New York study), probably because their greater convenience makes for more consistent use. However, all investigators agree that the findings, and particularly the calculated "failure" rates, must be re-

<sup>2</sup>No data from the test of oral steroid pills in Los Angeles, begun in 1956, are given.

garded as extremely tentative because of the relatively short periods of use so far, the small numbers of patients in the samples, and the heavy drop out of cases unknown as to selectivity. The oral contraceptive pill, a synthetic steroid, appears to be quite effective, even for women of the lowest economic and educational level, but the occurrence of undesirable side reactions caused about one in seven cases to withdraw. The same cautions as with the tests of vaginal methods are necessary with respect to length of time used, sample size, and high rate of patient withdrawal from the study. In addition, the possible effects on the ovaries of prolonged steroid medication are not yet known. About half of the medical evaluation section is devoted to the problem of these undesirable possible side effects, and the conclusion is reached that steroid medication should be restricted to short-term use under close medical supervision for child-spacing purposes. Evidently oral pills of the type developed so far cannot be recommended for general distribution.

In spite of the brevity and incomplete nature of the research progress reports and the non-exhaustiveness of the bibliography, this technical section on simple contraceptive methods should prove informative and useful to the many doctors who are unable to keep fully abreast of the current technical literature, and to lay persons concerned with the problems of family planning and means of control of population growth. For the statistician it serves as one more illustration of the poor quality of so much of medical statistics: crude measures of poorly defined variables on small samples for which the composition and selectivity are largely uncontrolled and/or unknown. Some of the defects can be attributed to the nature of the subjects, especially in a relatively free society; others are at present unavoidable, even by investigators who recognize and appreciate them, because of the primitive state of basic knowledge and research techniques in this area. The sociologist, however, could demonstrate that some of the difficulties can be attributed to certain features of the traditional organization of medical practice which impede ready adaptation to medical research of techniques for collecting, recording, pooling, and analyzing data found invaluable in other fields. This is not the place to

analyze the problem, but it may be suggested that lack of funds is not the principal obstacle to medical evaluation of the effectiveness of various contraceptive techniques. There is urgent need for investigation of how medical statistics can be improved both within the traditional structure of medical practice, and by exploiting fully the advantages for research of the new institutional forms emerging from the expansion of prepaid medical care plans and public health programs.

The section of this book devoted to the assessment of the moral and social implications of simple contraceptives seemed to this reviewer at first reading to be superficial and platitudinous. Later, closer reading revealed that on the contrary every page contained several interesting and worthwhile observations or raised provocative questions. However, there are few data here, almost no mention of research completed or in progress, and none explicitly proposed as necessary or desirable. There are ideas, but none is developed. The material is so condensed that its chief usefulness is likely to be as a source of suggestions for discussion and expression of opinion among other groups. The doctor as such is likely to find it irrelevant. There was no challenge to the statement in the symposium that the responsibility for proper use of contraceptives is individual and personal, and therefore moral; that it is not the job of the medical profession to develop moral restraints and controls among patients, but the job of church and family.

RUTH RIEMER

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### THE FERTILITY OF AMERICAN WOMEN<sup>1</sup>

WHILE the United States has lagged behind other countries in developing a nationwide and well-functioning system of birth registration, information on children ever born and on children under five years of age living with their mothers was obtained and published in considerable detail as early as the census of 1910, followed by the censuses of 1940 and 1950.

<sup>1</sup> Grabill, Wilson H.; Kiser, Clyde V.; and Whelpton, Pascal K.: *THE FERTILITY OF AMERICAN WOMEN*. New York, John Wiley & Sons; London, Chapman & Hall, 1958, 448 pp., \$9.50.

The monograph under review rests mainly on this body of census data, supplemented by related material from the Current Population Survey (CPS) and other sources.

The volume is organized into 11 chapters, including a brief introduction and a recapitulatory summary. Two chapters, furnishing a "long view" from the colonial period to the mid-1950's, are followed by a thorough discussion of trends and differentials in fertility in the 20th century comprising four chapters and more than half of the total number of pages. The emphasis is on residence (urban-rural), color, education, and occupation of husband. Other variables are considered to the extent that information is available. A short chapter focusses on marriage and patterns of family building which have been discussed in more detail in another census monograph: *AMERICAN FAMILIES*, by Paul C. Glick.

The ninth chapter, dealing with the fertility of cohorts of native white women, draws heavily on Professor Whelpton's earlier studies. It culminates in an analysis of the increase in the number of births during the period 1945-1954 as compared with 1930-1939. Of the total increment, 24 per cent is ascribed to the larger number of women, 30 per cent to higher cumulative marriage rates, 34 per cent to higher rates of first births per 1,000 ever-married women, and only 12 per cent to increase in family size per 1,000 mothers. The discussion of the outlook for births (Chapter 10) is brief and avoids a critical confrontation of the cohort approach with the traditional method used by the Bureau of the Census.

American demographers are indebted to the authors for having packaged into a manageable volume a vast body of data and for having provided authentic and authoritative interpretation. The monograph will long remain a benchmark for future studies. It will also serve to reveal shortcomings in our official statistics on the subject of human fertility. In the reviewer's opinion, the principal defects are: relative lack of attention to duration of marriage in the analysis of fertility and absolute lack of any analysis by religion. The former stems, at least in part, from our failure to establish a nationwide system of marriage registration and from our reluctance to include in the standard certificate of birth a question on duration of mar-

riage. However, information not available from current statistics, can be—and in fact has been—obtained, to some extent, from census data.

No remedy has been found, on the other hand, for the lack of official statistics that would permit analysis of fertility by religion. In the United States, a major political taboo has prohibited up to now the collection of census statistics on religion other than those obtained through the periodic Census of Religious Bodies which cannot be used for the study of fertility. To fill this gap, the Bureau of the Census included a question on religious preference in the CPS of March 1957. The information was obtained without difficulty, with less than one per cent of the respondents failing to report. Since the survey of March 1957 also covered educational attainment, husband's occupation, and income, the stage was set for a comprehensive analysis of social and cultural factors affecting fertility. It is the reviewer's understanding that the requisite tabulations were indeed made, but that the data on religion were omitted from publication owing to pressures from unidentified persons or groups outside the Bureau. At about the same time, plans for including a question on religion in the 1960 census were abandoned.

It is the reviewer's belief that society has the right and the duty to inform itself on all important aspects of its own existence and that where the task exceeds the capabilities of individual scholars and private organizations, the information should be obtained through government. Available studies, based on samples limited as to size or geographic coverage, have made it clear that religious affiliation is an important factor in reproductive behavior. More detailed information on this subject is urgently needed. This information was obtained in 1957 from the relatively large CPS sample but, except for a brief table in *Statistical Abstract of the United States, 1958*, has not been published. It seems appropriate, therefore, to conclude a review of *THE FERTILITY OF AMERICAN WOMEN* with a plea to the new Secretary of Commerce to reverse the decision of his predecessor and to release the data on religion and fertility.

CHRISTOPHER TIETZE, M.D.

SELECTED STUDIES OF MIGRATION SINCE  
WORLD WAR II<sup>1</sup>

THIS volume is a very valuable contribution to the increasingly interesting subject of migration, internal and international, whether viewed practically or theoretically. The names of the round table, whose papers and reflections are here recorded, guarantee excellence. There are research papers by Dudley Kirk, Irene Taeuber, C. Horace Hamilton, Donald J. Bogue, and Everett S. Lee; theoretical constructs by Rupert B. Vance, John K. Folger, Joseph J. Spengler, and jointly by Simon Kuznets and Dorothy S. Thomas; and a paper by Ernest Rubin on American policy. All deserve reading by anyone interested in this field. Space limits me to a few among many reactions.

One need not detail the revolutionary changes in man-land ratios, in agricultural and industrial technologies, in transport and mass communication media and in the rising ferment among previously inert masses to realize that migration, both between and within nations, has taken on new forms and renewed interest. This is shown by some of the terms here used. Kirk opens with a differentiation of "free" ("individual choice") and "forced" ("imposed by fear or force"). Vance emphasizes "planned" as opposed to "spontaneous." Spengler contrasts "individual" and "collective." One may add that much of English emigration, for example, has been "assisted"; immigration into countries offering special aids might be called "induced"; or if financed by private agencies "recruited." One might emphasize the dichotomy in Kirk's term, "forced," limiting "forced" to transfers giving the individual no choice and defining as "compulsive" those panic-like movements, such as the Muslim-Hindu exchanges where deep emotional stresses, rather than *force majeure*, are the dominant propulsions. Finally, the terms "restricted" and "selective" reveal other new trends of this century.

Several references are made to the greatly increased costs of migration and to the need of planning by both private and

<sup>1</sup> SELECTED STUDIES OF MIGRATION SINCE WORLD WAR II. Proceedings of the 1957 Annual Conference of the Milbank Memorial Fund, Part III, New York, Milbank Memorial Fund, 1958, 244 pp. \$1.00.

public agencies. (Vance, p. 82; Spengler, pp. 38, 194; Senior, p. 193) Kirk's splendid table (pp. 18-19) reveals the largest overseas movement of Europeans since the early 1920's, and he notes "the resurgence of the old pattern of individual migration." Much of this movement, however, was composed of persons displaced by the war; much of it was assisted, induced and (or) planned. No clear trend is indicated. It seems quite likely that the need of planning and the cost increases will continue and for numerous reasons. Among them are the wellnigh universal dominance of urban values and the emergence of the welfare state. These terms epitomize the revolutionary changes in the life expectations and the social environment of a large proportion of Europe's potential migrants. The European proletarian is no pioneer; he becomes locked in his social niche by social security against life's contingencies. If he resettles he must have not only company but many of the social services and amenities of modern urban civilization. These are costly.

Kirk also notes (p. 24) the partial failure of the land settlement policies of Indonesia and the Philippines. One wonders to what extent this may be due to the absence of our cultural values of competition and individual success, associated with age-old patterns of family economic solidarity.

Rubin's criticisms of present American policies seem to me only an expression of variant personal values, and his flexible policy seems ill-conceived. It is naive to expect the politicians in a democracy to reject ethnic or racial biases that will make votes for them. There is no scientific mandate as to optimum numbers or absorptive capacity, as Hutchinson and Peterson point out. An "invidious distinction" is likely to be a social value one does not share; and social policies are based on social value judgments, though we hope scientific findings may help in their formulation. We surely cannot open the gates to every distressed group in the present world; nor do we dare neglect racial and cultural differences. We already have serious problems of social adjustment. To admit a fixed proportion of total population would be to admit more and more as our numbers became greater and greater.

Lorimer (p. 219) broaches what seems to me is the over-



shadowing problem in this field, namely, what shall be our policy toward the increasing outward pressure of populations in underdeveloped lands. Emigration is in most cases only temporary relief for them. Because of differences in race and color, their immigration causes serious problems of social adjustment. Witness Mexicans and Puerto Ricans here, West Indians in England, Algerians in France. Since World War II we have deported for illegal entry more Mexicans than persons from all sources in previous history. Our own numbers are zooming; we are said to have one million too many farm families; we are committed to full employment which the Cohen Council in England and our own economists find incompatible with stable prices. Rubin's relaxation policy seems no solution; nor does Spengler's idea of investing abroad touch more than the fringe of the matter. Here lies the dilemma that points to continued cold war and inflation for us and increasing unrest throughout the rest of the world.

Finally, I am led to ponder the social utility of this and other splendid exhibitions of scientific proficiency in the social field. Several recognize the contingent character of social science findings and the lack of mandates from them regarding social policy. (Spengler's paper, pp. 192-3 and comment, p. 175; Bogue, pp. 170-1; Gibbons and others.) Causes are so numerous and their combinations so varied that the probability of any given conjuncture of forces and conditions being repeated is not high. We have generalizations, trends and correlations, but there is a wide gap between the applicability of such "laws" as the Malthusian or supply and demand and the law of the variation of light with distance from source. Here is a finding that is universal and eternal. This does not mean that social research is useless. On the contrary the increasing complexity of social activities requires far more and ever better investigations. Vance suggests the coming use of Univacs and this seems promising. What he means by "break through" (p. 167) is not clear but I should not anticipate "laws" that encompass the future. The prestige of social scientists seems on the rise and we may at least hope that the policy makers will listen more and more closely to what they have found.

FRANK H. HANKINS



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